

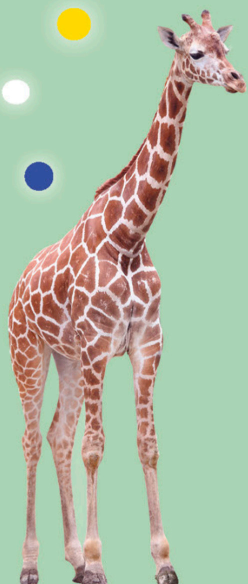
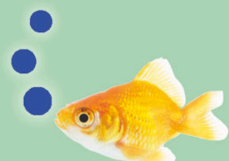
1000 WORDS NATURE

Build nature vocabulary and literacy skills

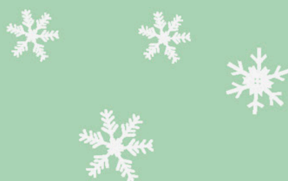





1000 WORDS NATURE

Jules Pottle






About this eBook

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For previewing rotated pages or spreads, please lock screen rotation in your device first.

If you are previewing this eBook on a mobile phone, portrait mode is recommended. If previewing on a tablet or larger display, landscape mode will allow you to see facing pages at the same time (two page view).



Penguin
Random
House



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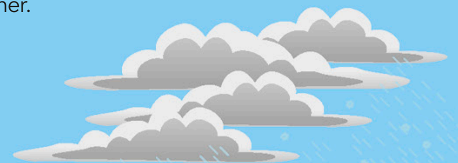




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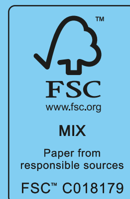
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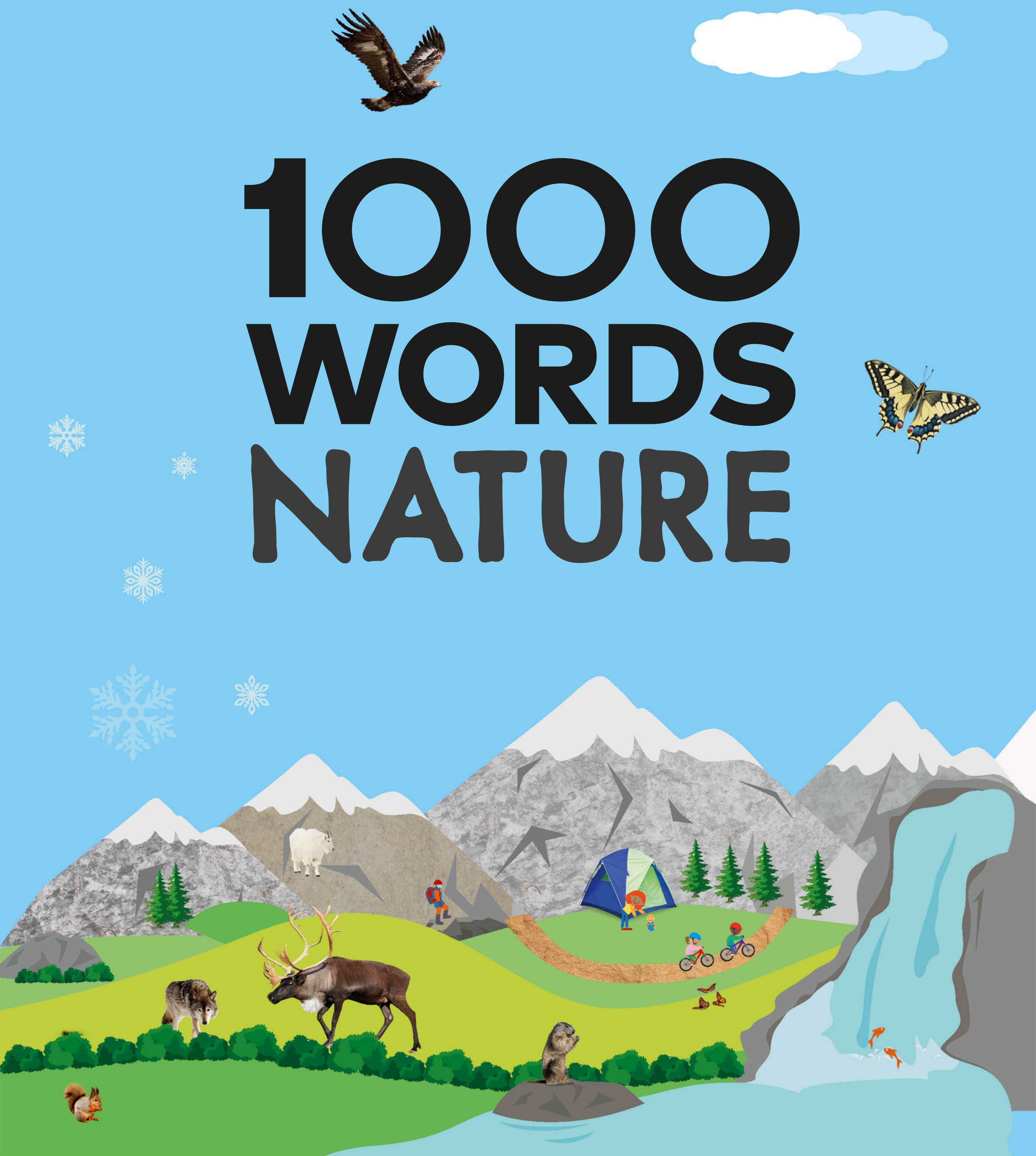








1000 WORDS NATURE



A note for parents and carers

The importance of knowing about nature

In this technological age, being aware of the beauty and complexity of nature is an important part of our wellbeing. If you take the time to look and listen to what is around you, you'll discover all sorts of natural wonders. Even on a city street, the world is teaming with plant and animal life, and in every habitat on Earth, each living organism is important in its own way.

Young children are natural explorers. They like to touch and smell and immerse themselves in their environment. This book will give them the vocabulary to talk about what they have experienced, and build their knowledge of topics relating to wildlife, the environment, and our planet. It will prompt children to ask questions and lead them to look further and to learn more.

I grew up with "elephant" and "giraffe" as familiar words in my alphabet books, but my grandchildren may never see those animals in real life. We have reached an important moment in the future of our planet. The choices we make now will affect the lives of our children and our children's children, so it is important that we are all fully informed of our impact on the planet and what we can do to protect it. This book is a great place to start a young child's appreciation for the natural world and to begin to talk about living responsibly on our planet.

Jules Pottle
Primary science consultant, teacher, trainer, and author

Contents

SAFETY INFORMATION

Outdoor recreational activities are by their nature potentially hazardous. Parents need to assist and supervise their children for many of the nature activities shown in this book. Everyone should assume responsibility for their own actions and prepare for the unexpected for a safer and more enjoyable experience.

Our planet

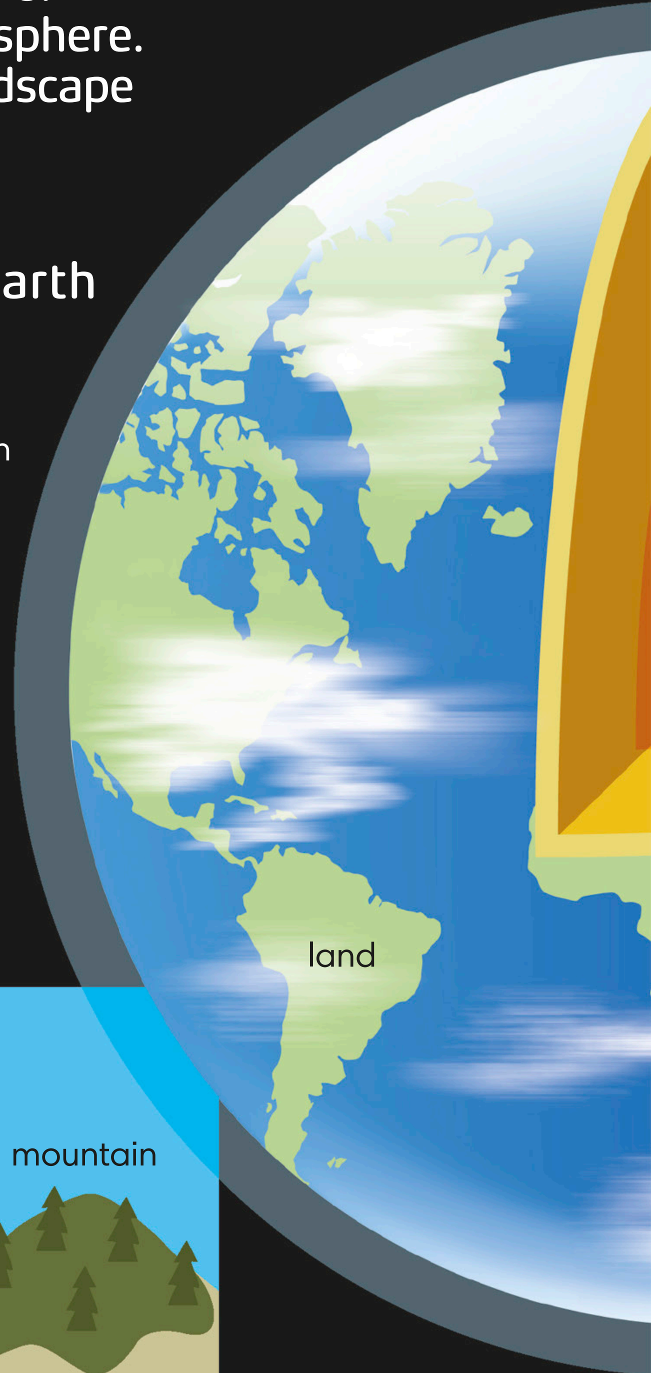
Earth orbits the Sun in space. Inside Earth is a hot core of liquid rock. Around the outside of Earth there are gases, called Earth's atmosphere. Earth formed a very long time ago. Its landscape and wildlife have changed over time.

outer space

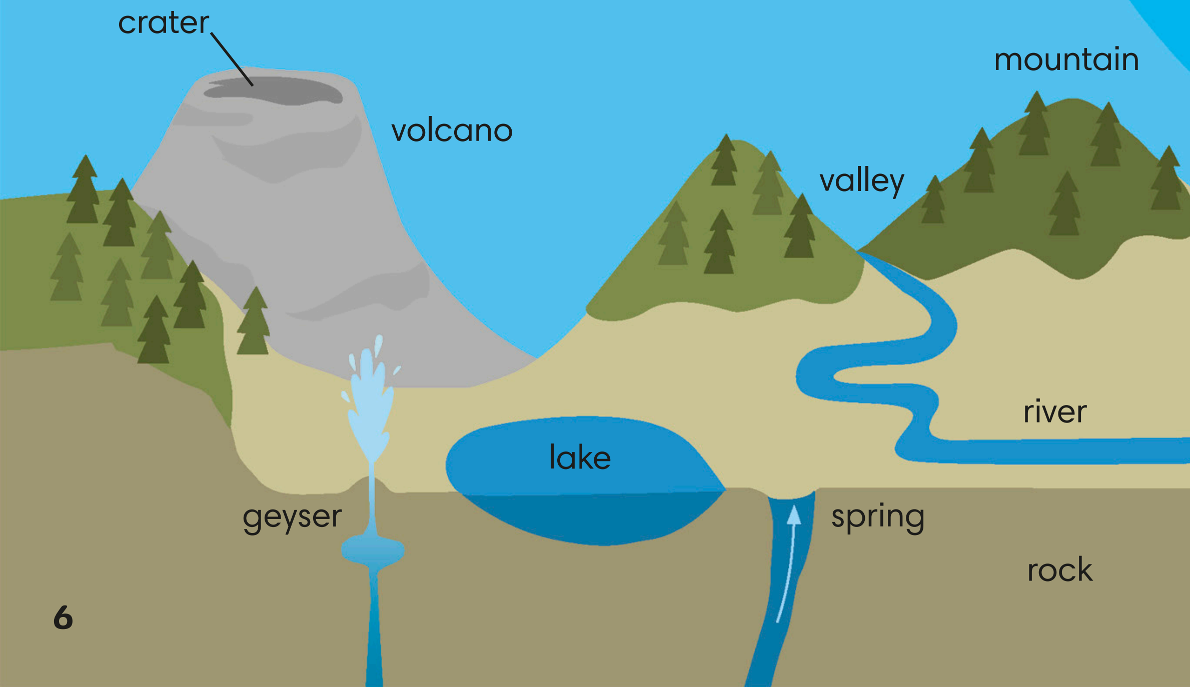
Is most of Earth's surface covered with land or with water?



Moon



Some landscape features



North Pole

Sun

crust

mantle

meteor

outer core

stars

inner core

ocean

atmosphere

South Pole

Some animals from long ago


Megazostrodon


pterosaur


dinosaur


ichthyosaur


mammoth

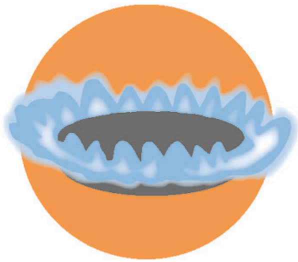
Which animal from long ago has a name that means terrible lizard?

Our world's resources

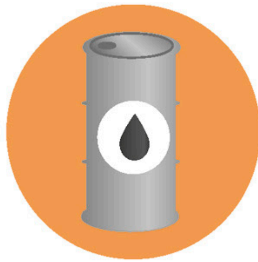
Our world is filled with useful materials. We must try not to waste them. We also need to reduce the pollution that some materials cause.

Non-renewable resources

fossil fuels



gas



oil



coal

Fossil fuel transport



aeroplane



diesel truck



petrol car

Pollution



oil spill



plastic

throw away

single use



Rubbish

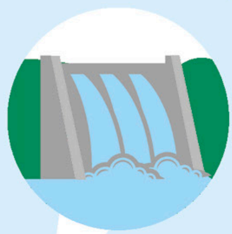
wasteful

Helping our world

What things can we recycle and what can we reuse?



Renewable resources



water power



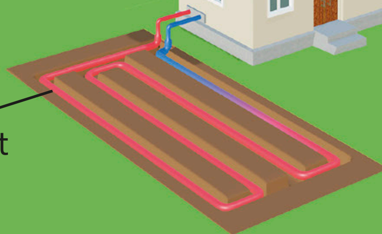
sustainable energy

wind turbine



insulate houses

saving energy



ground source heat



solar panels



compost



water butt



recycling bin



pick up litter

compostable plastic



shampoo bar



turn off the tap

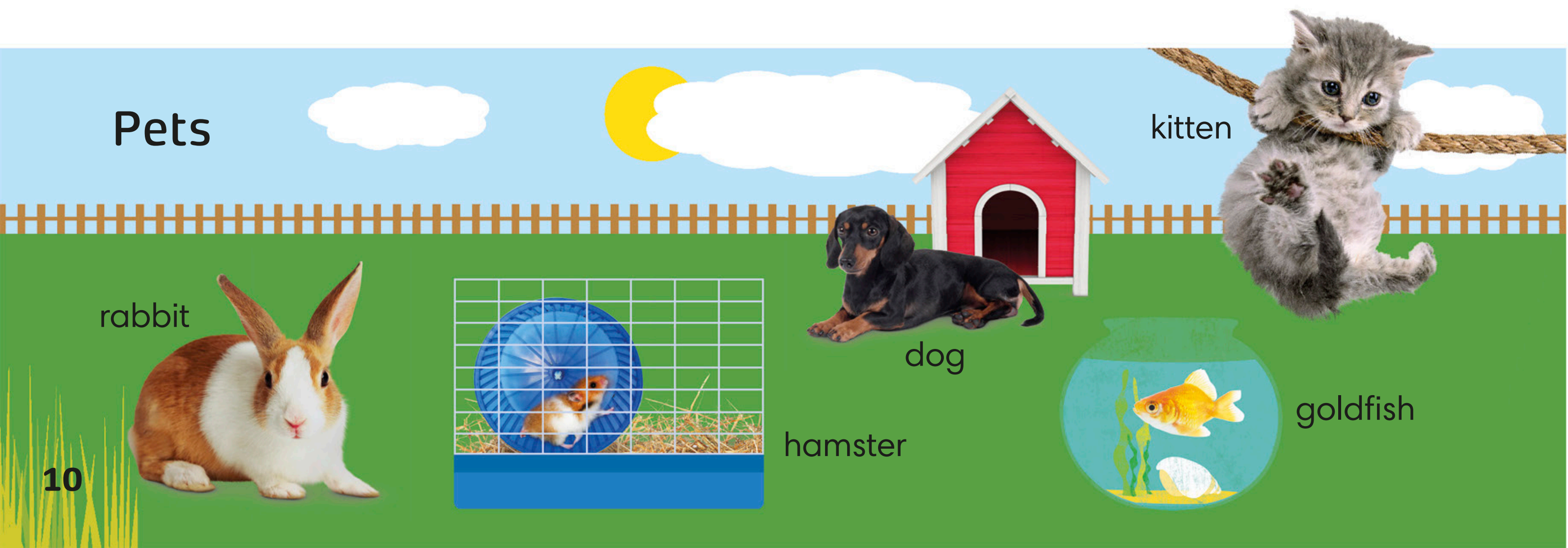
Humans and nature

For thousands of years, we humans have made nature work for us. We should do this respectfully, taking care of our planet and the things that live on it.

On the farm

fruit trees
tractor
wheat crop
fields
milking shed
cow
geese
goats
grain
fruit
sheep
chickens
vegetables
pigs

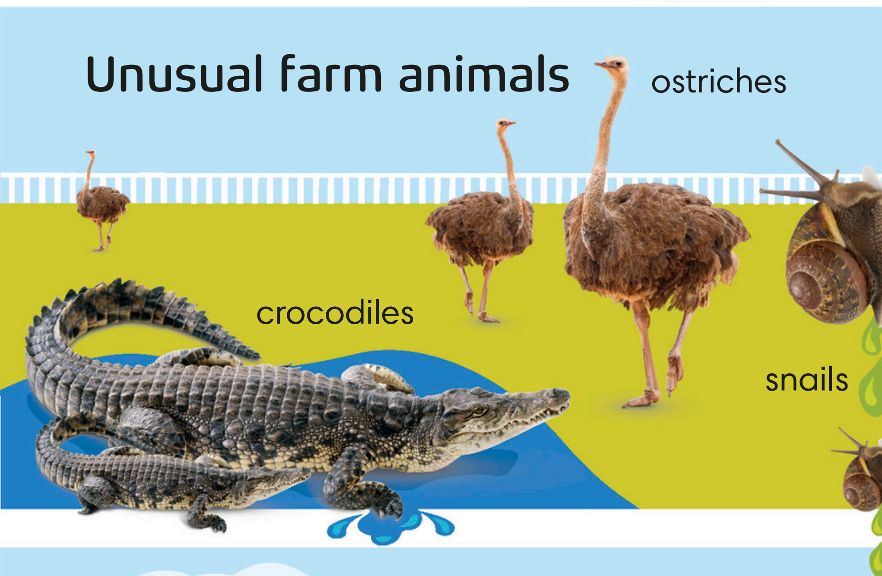
Have you ever taken care of a pet? What do pets need?







Unusual farm animals



Working animals



More types of farming


flower farming


rice farming


vineyard


tea plantation

Farms around the world grow different crops. Do you know what's grown in a vineyard and used to make wine?

Working with water


dam


canal

Mining


limestone quarry


coal mine

Nature activities

There are so many fun things we can do when we go out and enjoy nature.

nature spotting

bark rubbing

nature trail

binoculars

building a den

tree hugging

touching

splashing in puddles

pond dipping

net

nature art

collecting

Forest school

fishing

reading a map

We could start a nature collection. What things might we collect?

binning litter







Let’s choose some things we’d like to do when we go out.



treehouse

birdsong

looking

listening

bird
watching

smelling
flowers

picking
apples

digging

watering
plants

sweeping
leaves

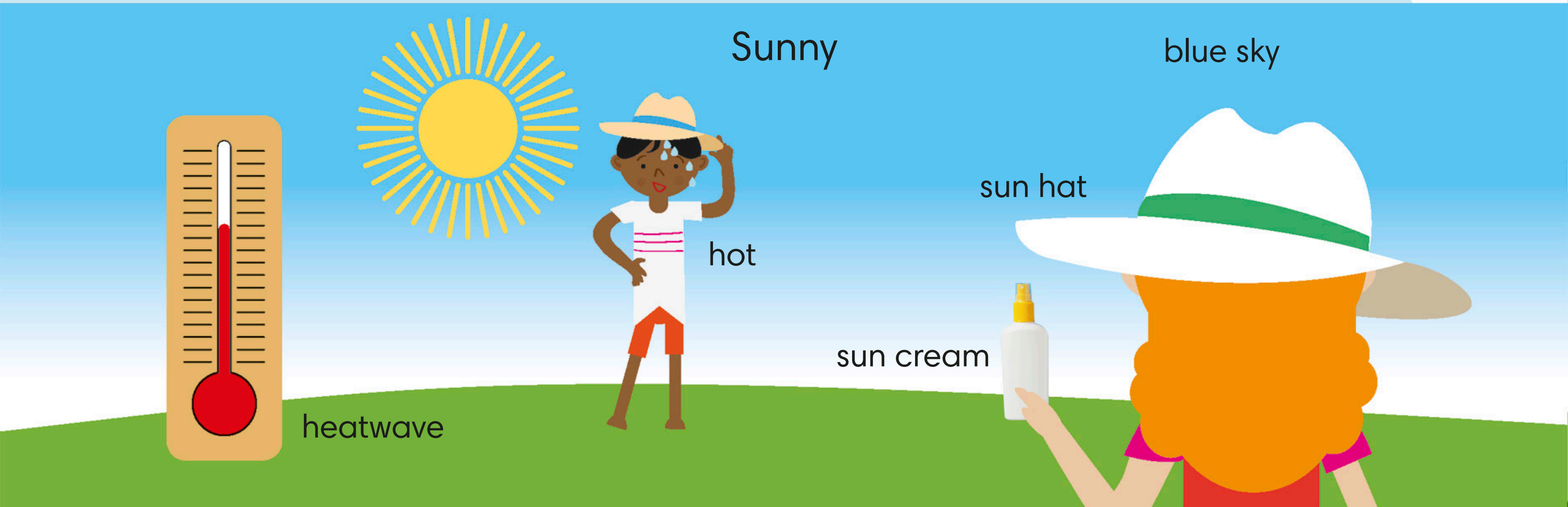
having a
picnic

planting
seeds

Weather

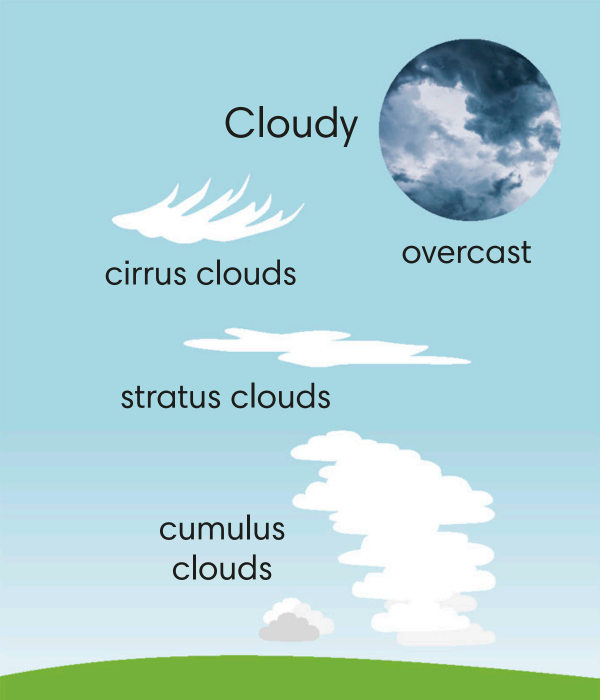
The weather is different in different places. Some countries have four seasons; others have two.

What's the weather like today?

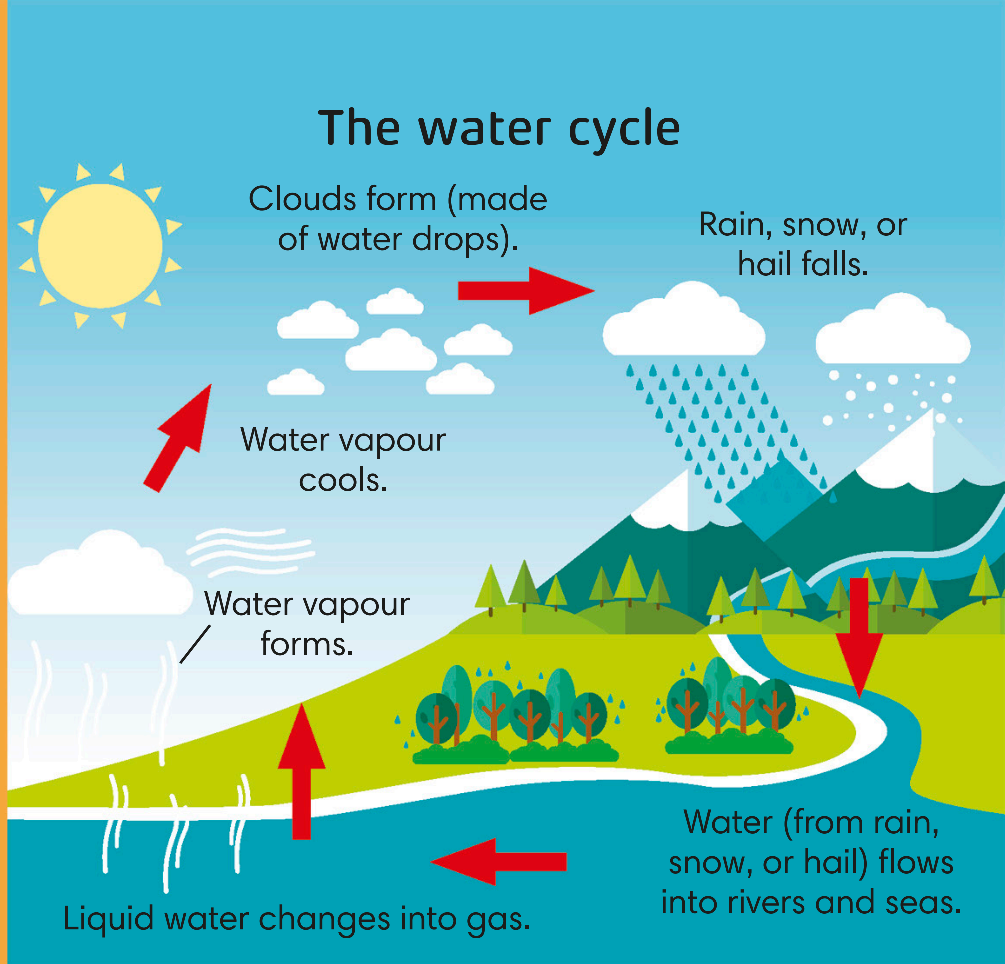












Four seasons


spring

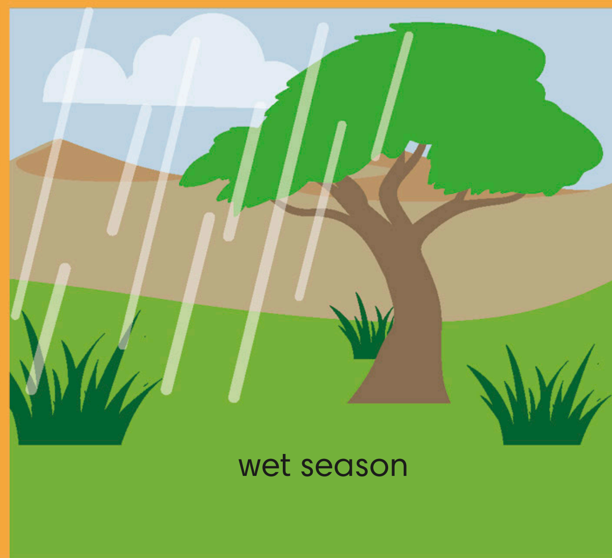

summer


autumn


winter

Two seasons


dry season


wet season

What type of weather do you like best?

Extremes

From hurricanes and floods to dry deserts and frozen lands, our planet has some extreme weather and some incredible locations.

Spot a type of foggy weather that is caused by air pollution.



Extreme weather



drought

arid



flood



tsunami



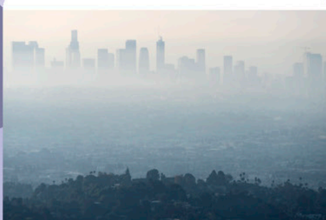
cyclone



hurricane



tornado



smog



sandstorm



extreme heat and wildfires



hailstorm



blizzard



ice storm

freezing

Incredible locations

Dead Sea,
Asia



lowest land area on Earth

Mount Everest,
Asia



highest land area on Earth

Furnace Creek,
North America



hottest recorded temperature

Vostok Station,
Antarctica



coldest recorded temperature

Atacama Desert,
South America



driest place

Mawsynram,
Asia



has highest rainfall

Angel Falls,
South America



highest waterfall

Grand Canyon,
North America



longest canyon

Kilauea Volcano,
Oceania



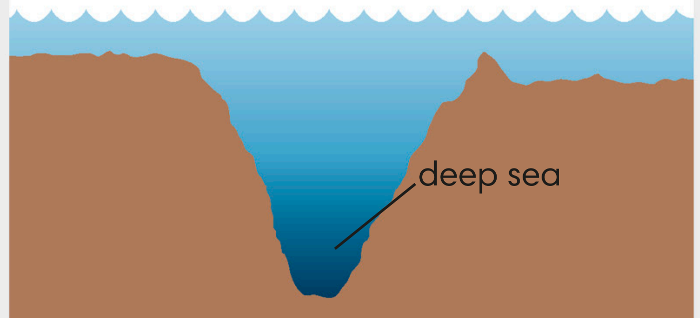
Earth's most active volcano

Great Barrier Reef,
Pacific Ocean



largest coral reef

Mariana Trench,
Pacific Ocean



deepest part of the ocean

Which of these amazing places would you like to explore?

Kingdoms of living things

Different features help scientists put all living things into groups. Here are the five major groups, called kingdoms, and some of the smaller groups that are within each kingdom.

Plants

Flowering plants

apple tree

rose

grass

Non-flowering plants

conifer

fern

mosses and liverworts

Fungi

mould

mushrooms

Protists

red algae

protozoan

Monera

bacteria

Molluscs

snail

oysters

Crustaceans

woodlouse

crab

Arachnids

spider

tick

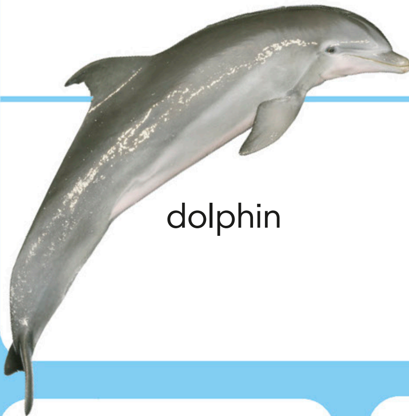
Cephalopods

squid

octopus

Animals

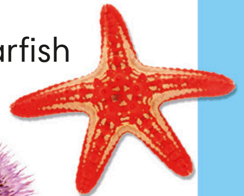
Mammals

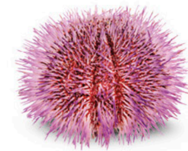

dolphin


kangaroo

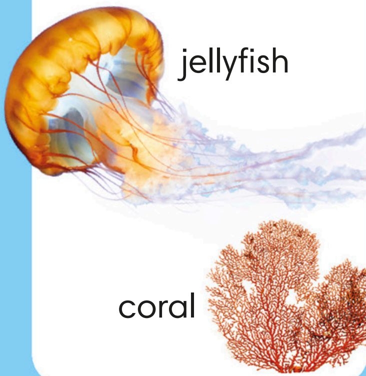

human

Echinoderms


starfish


sea urchin

Cnidarians


jellyfish

coral

Birds


robin

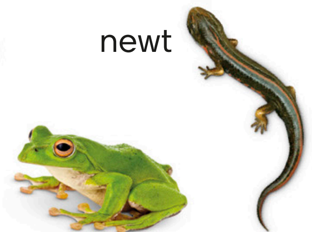

penguin

Reptiles


snake


crocodile

Amphibians


newt

frog

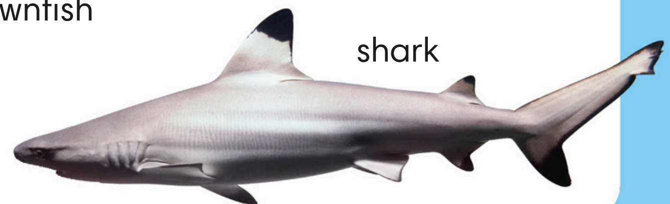
Poriferans


sponge

Let's think of some more mammals and some more reptiles.

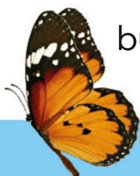
Fish


clownfish


shark

Insects


ant


butterfly

Myriapods


millipede


centipede

Annelids


leech


earthworm

All sorts of plants

There are many different plants, but they all do something amazing – they use water, air, and sunlight to make their own food. This process is called photosynthesis.

Herbs can be used to flavour food. What herbs have you tried?

Shrubs

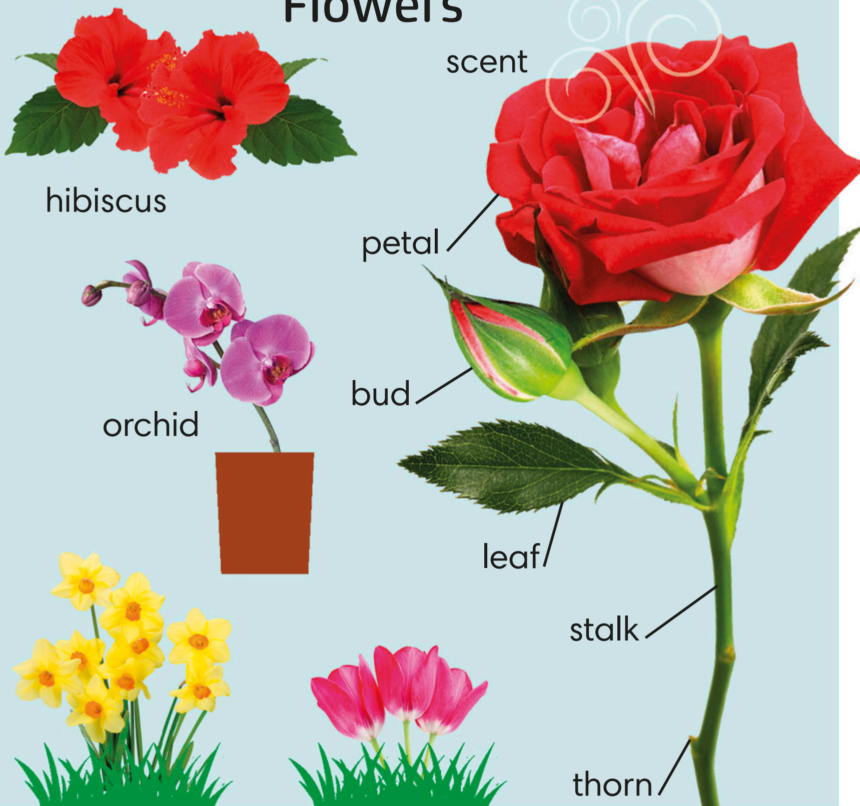


Herbs





Flowers



Guess where baobab trees store water.

Weird plants







Climbers

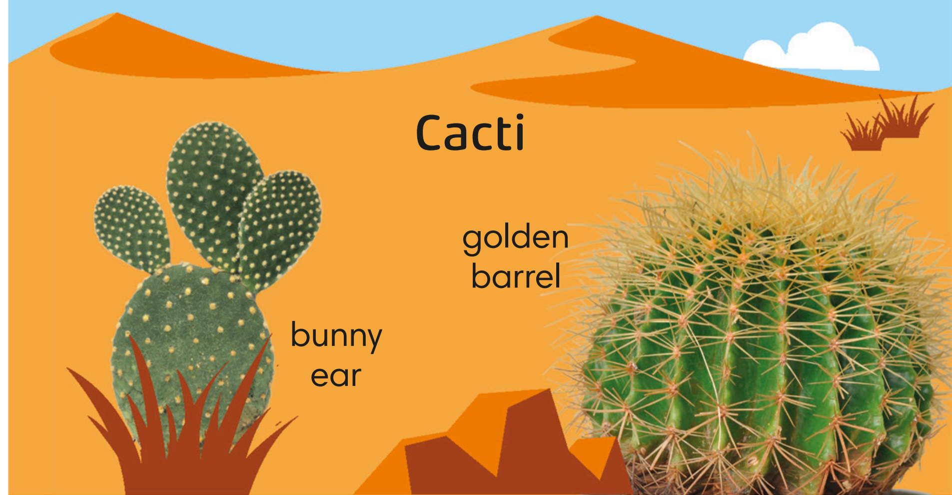


ivy



runner bean

Cacti



Trees

broadleaved



maple



weeping willow



palm

conifers



fir



pine

Fruit and vegetables we eat



orange



apple



kiwi fruit



carrots



cabbage



broccoli

Water plants

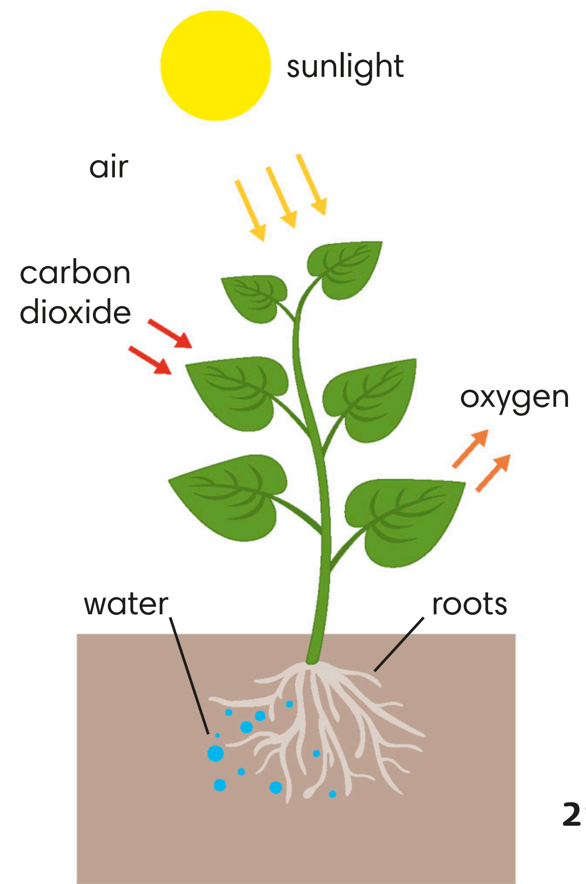


seaweed



water lily

Photosynthesis



A closer look at trees

A tree is a tall plant with a thick stem called a trunk. Like all plants, trees improve air quality by absorbing carbon dioxide and giving out oxygen.

sun

oxygen

Tree leaves

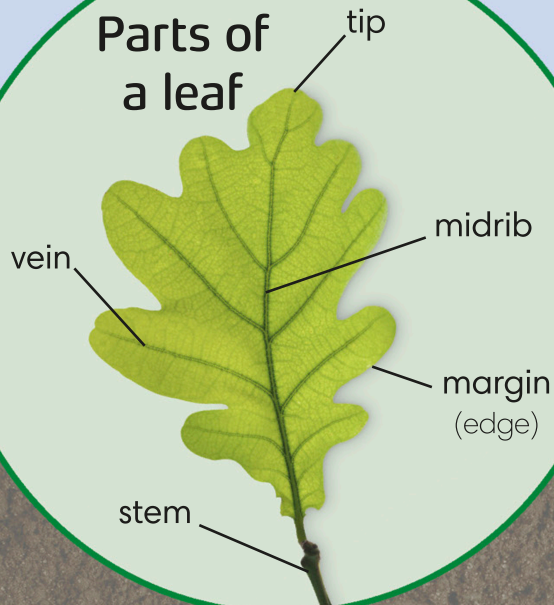

lobed


prickly


pointy


wavy edges


needles



pine needles

pine cone

twigs

roots

evergreen
keeps leaves all year

pine tree

carbon
dioxide

Tree flowers


cherry blossom


hazel catkins

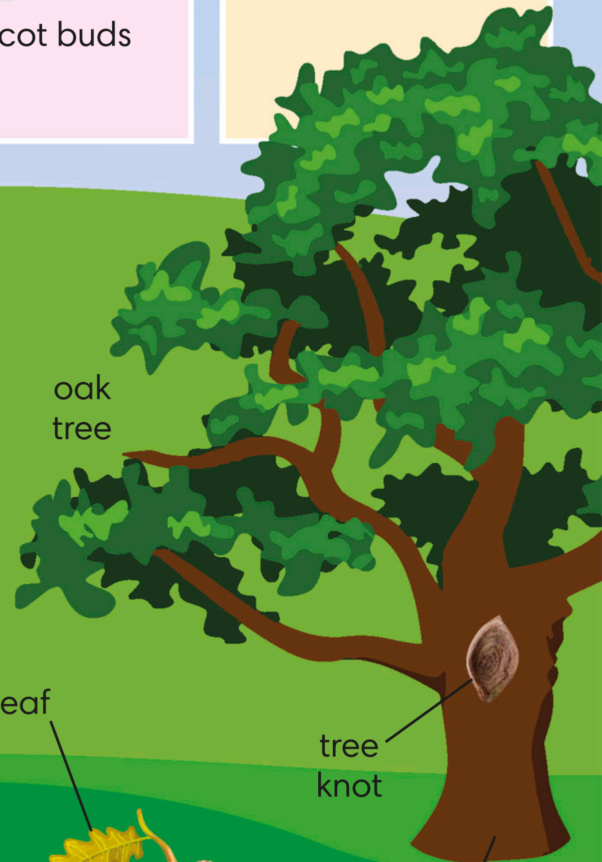

apricot buds

Tree fruits


apples


plums


lemons



branch

bark

trunk

wood

tree rings

sticks

oak leaf

acorns

deciduous
loses leaves
in autumn

The seed of an oak tree is inside an acorn.
Where would you find the seeds of a pine tree?

Plant and fungus life cycles

Most plants grow from seeds, bulbs, or tubers. Fungi grow from tiny spores.



pollinator

flower

plant

seeds

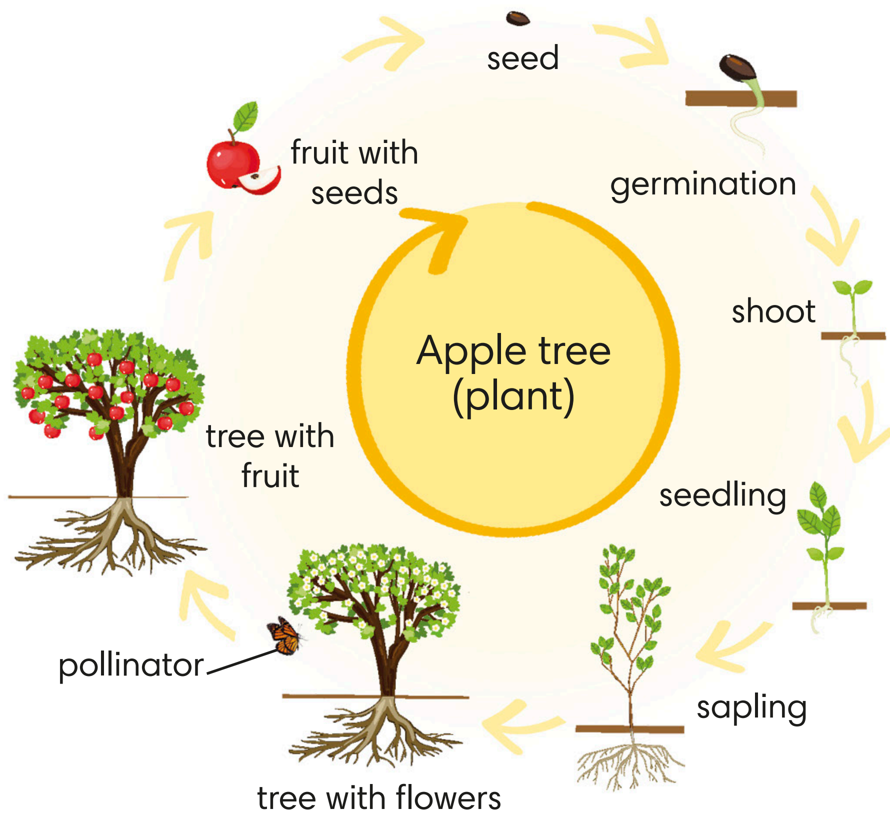
germination

Sunflower (plant)

shoot

seedling

Have you planted any seeds? How did you take care of them? Think of some things you did to help them grow.



More seeds



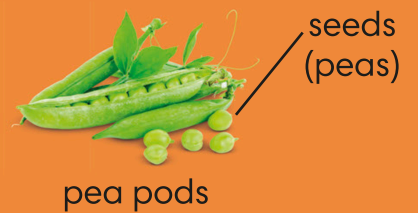
pine cone



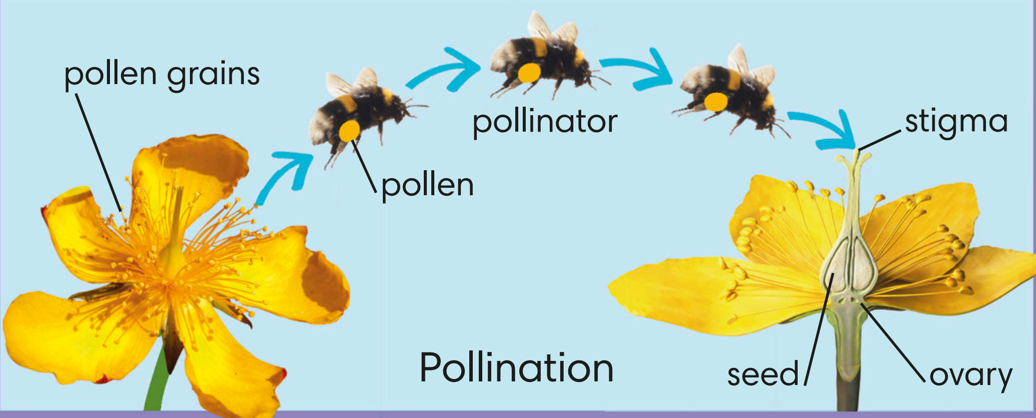
sycamore seeds



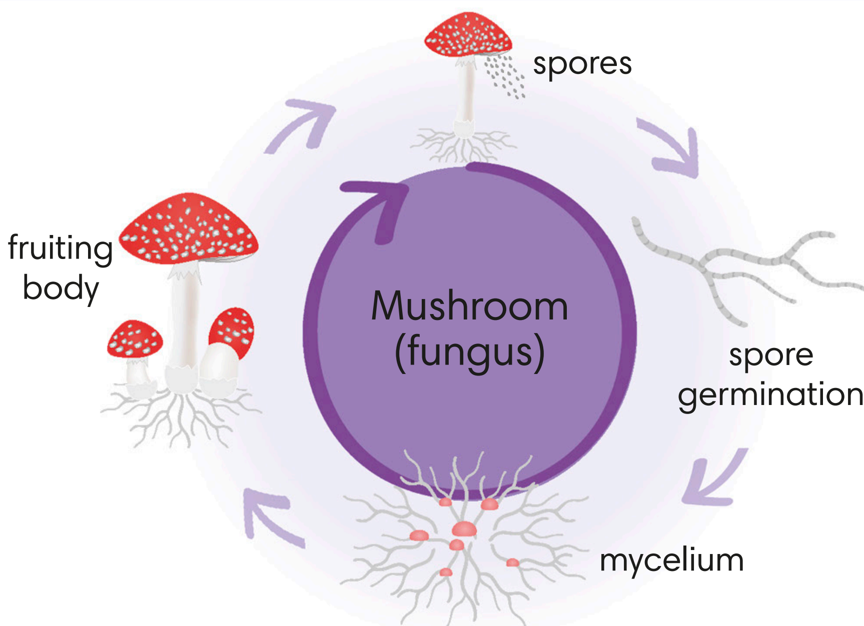
avocado stone



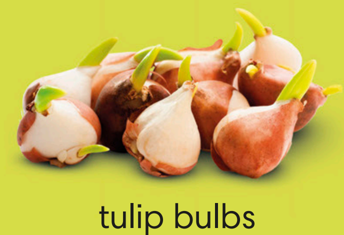
pea pods



Pollination



Bulbs and tubers



tulip bulbs

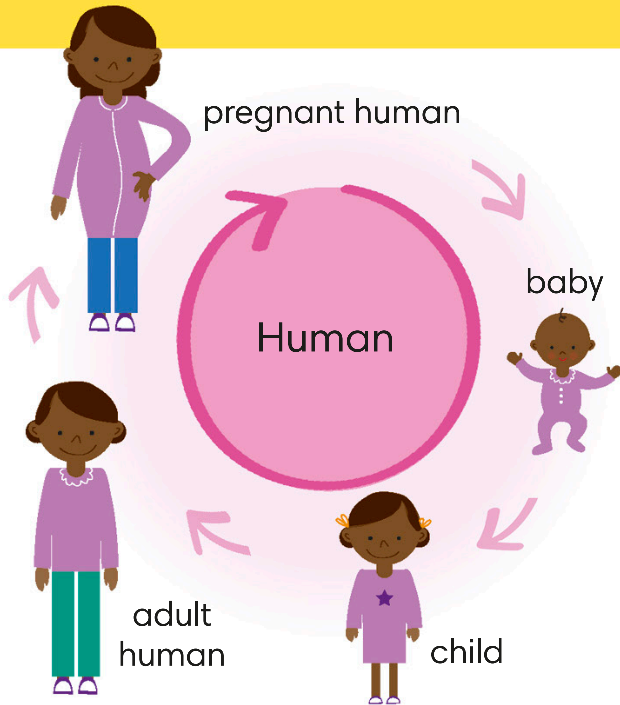


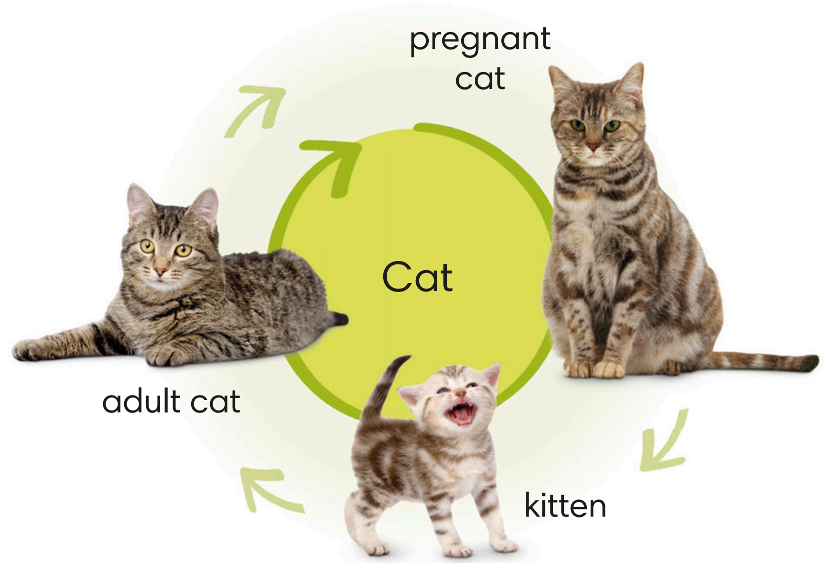
potato tuber

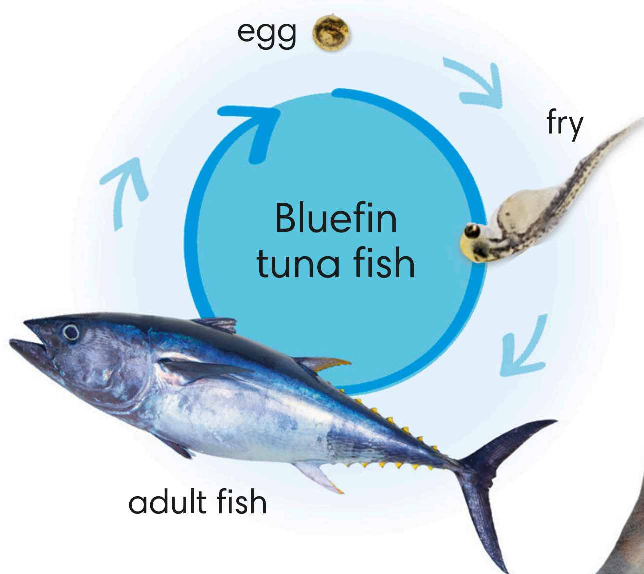
Animal life cycles

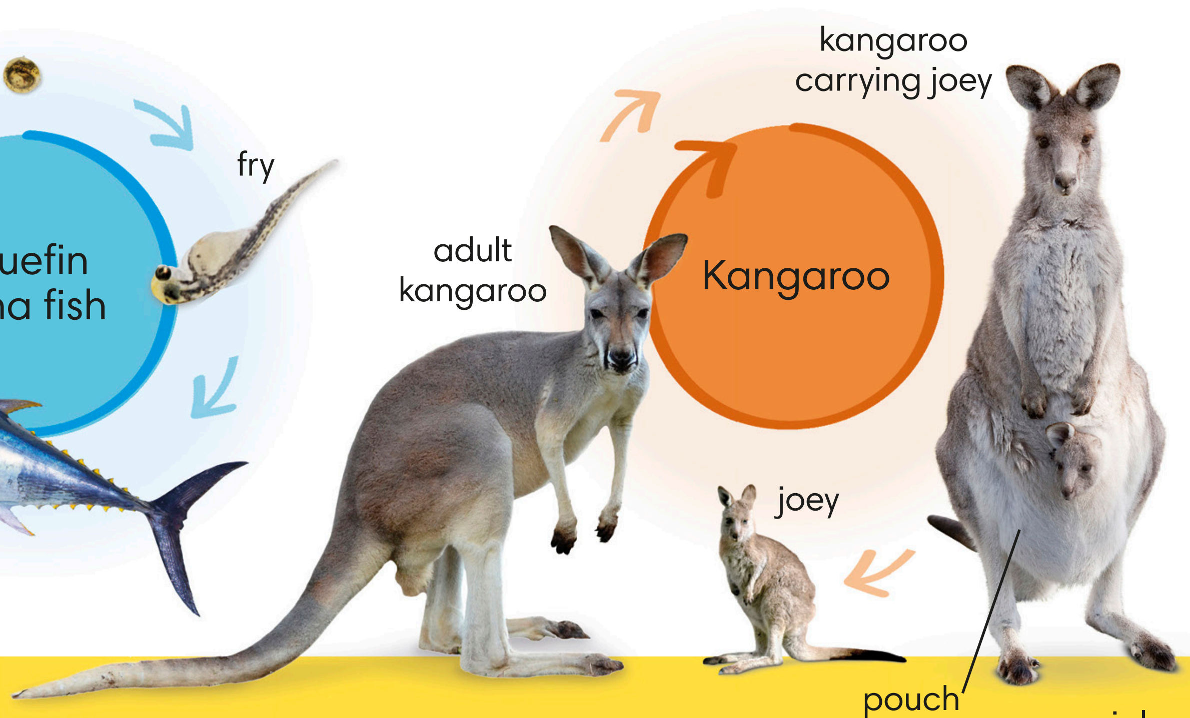
Cats have kittens, and the kittens grow into cats. Then those cats have kittens. Let's learn more about animal life cycles.



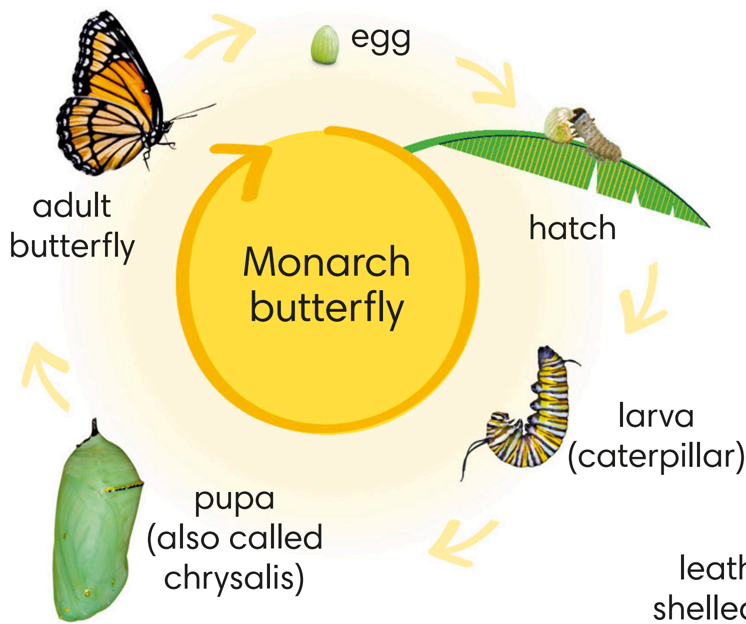


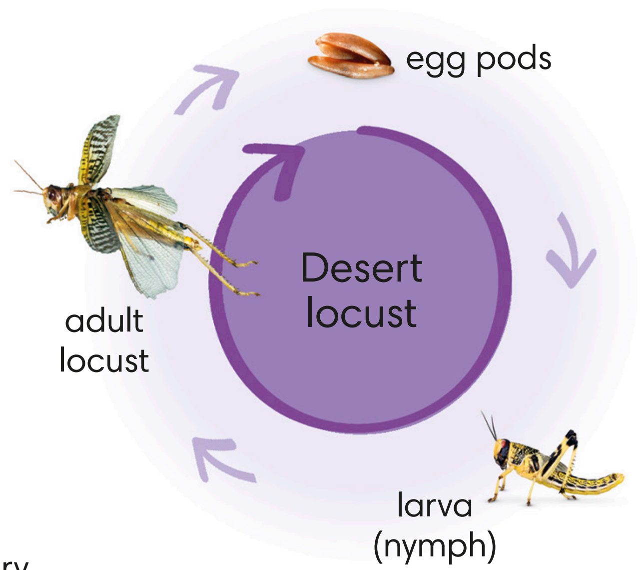


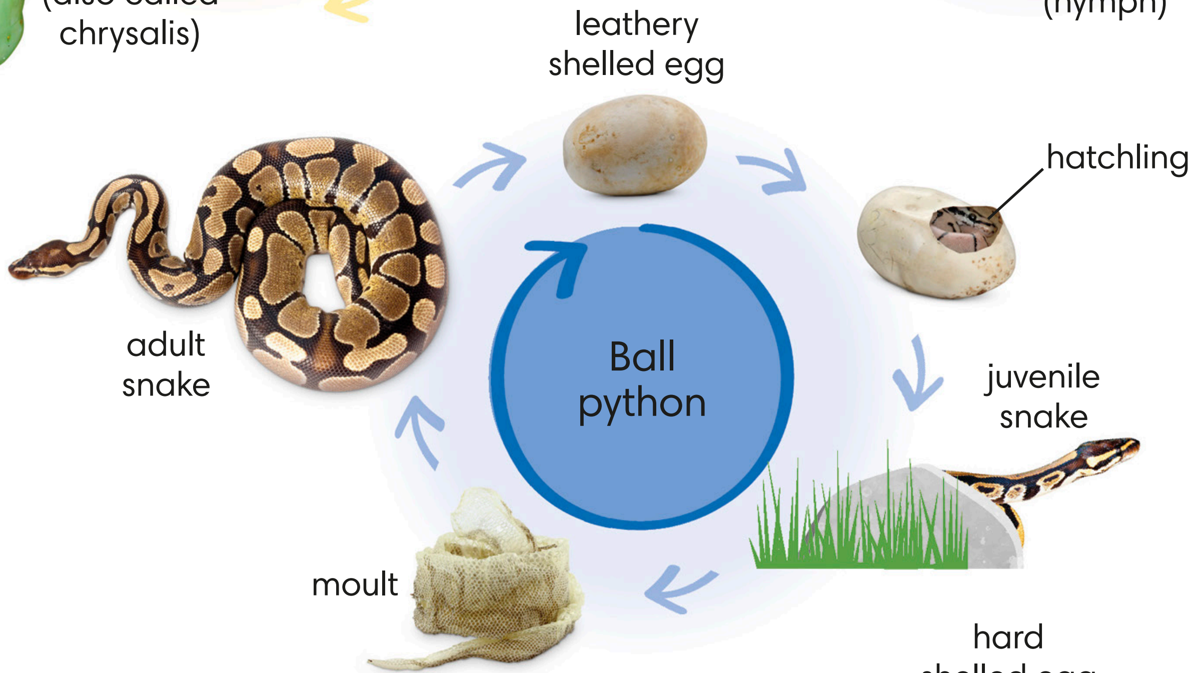


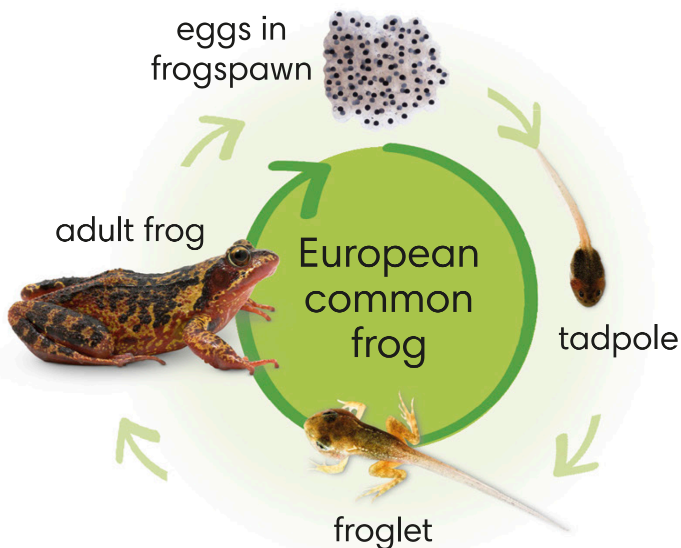


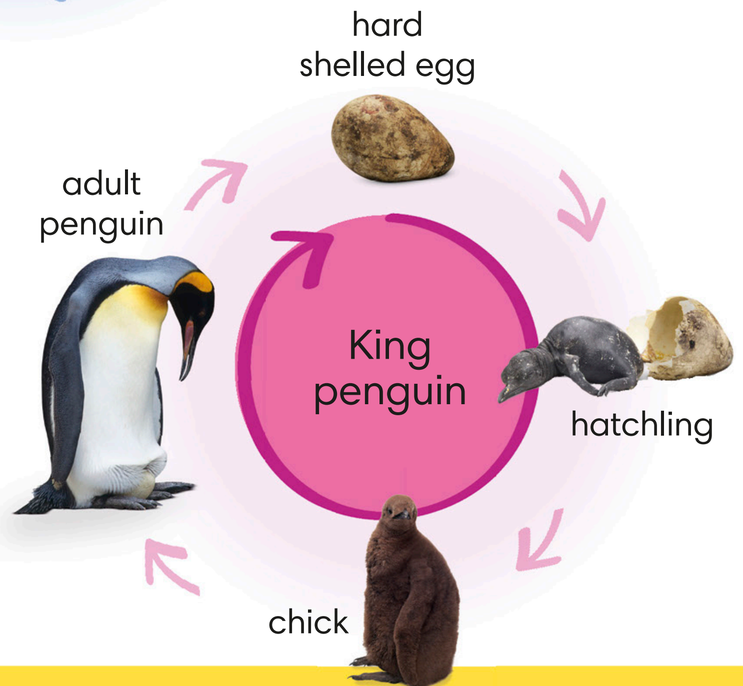
Can you spot the joey in its mother's pouch?







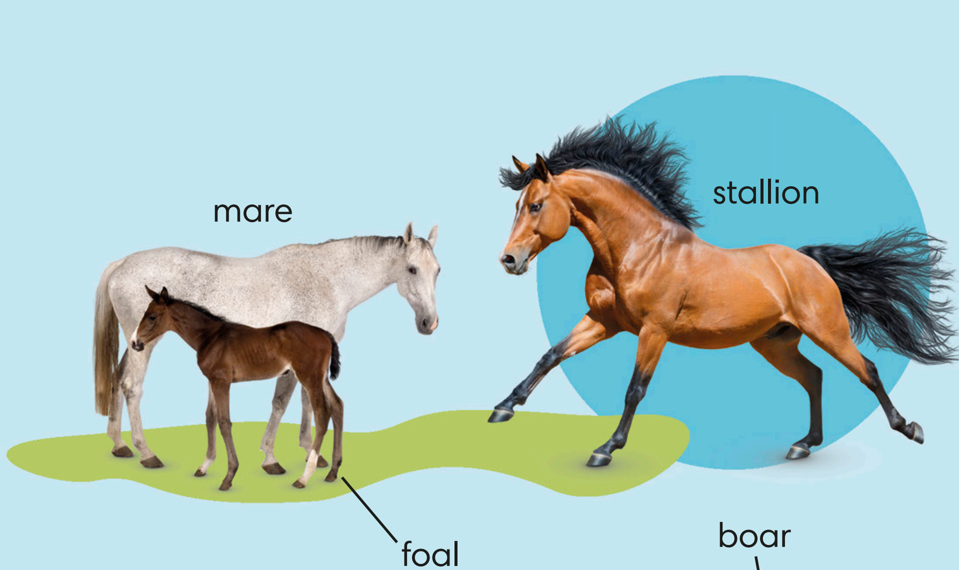


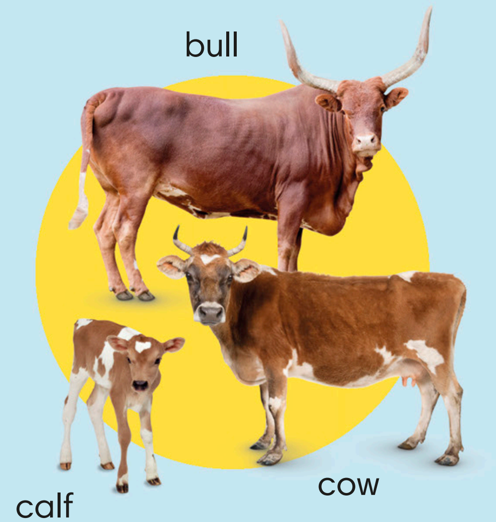


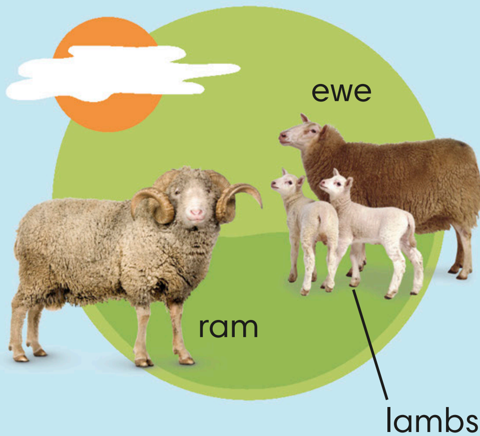
Do you know where frogs lay their frogspawn?

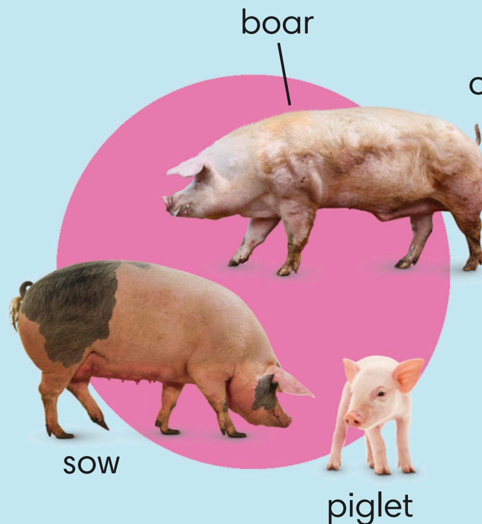
Animal families

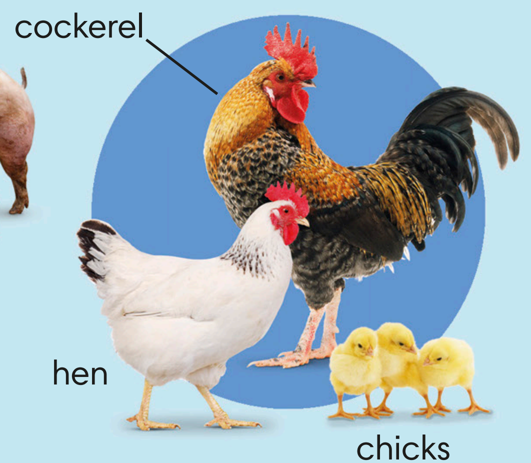
Can you name the female, male, and baby in each of these animal families? Some have special names and others don't.

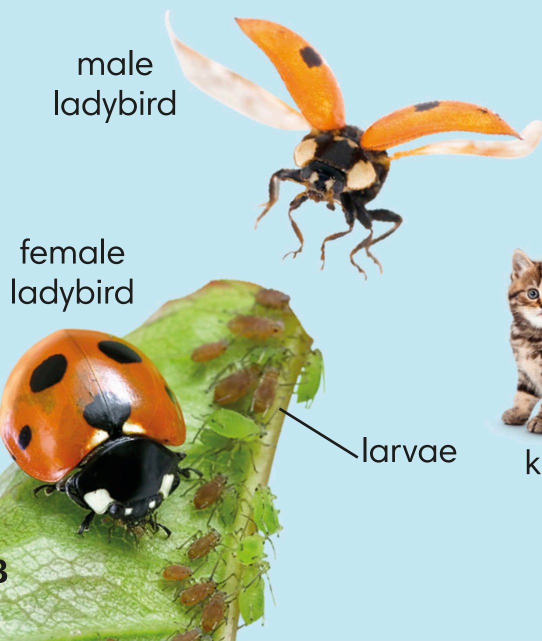


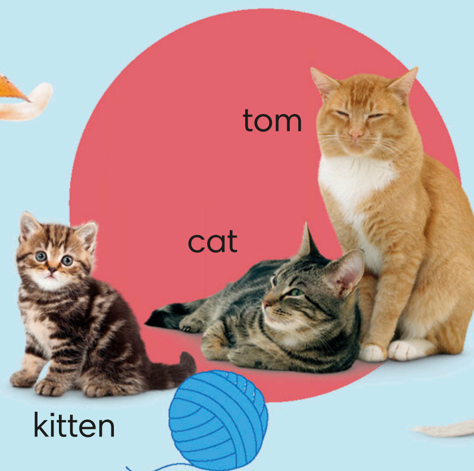














drake

duck

duckling

male spider

female spider

spiderlings

buck or boomer

doe or flyer

joey

doe

stag

fawn

boar

sow

cub

man

woman

baby

male turtle

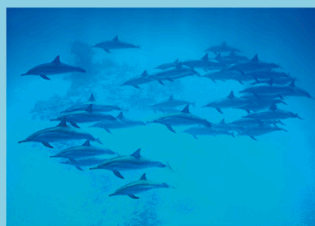
hatchling

female turtle

Animal groups

What names for groups of animals do you know?


pride of lions


pod of dolphins


flock of sheep

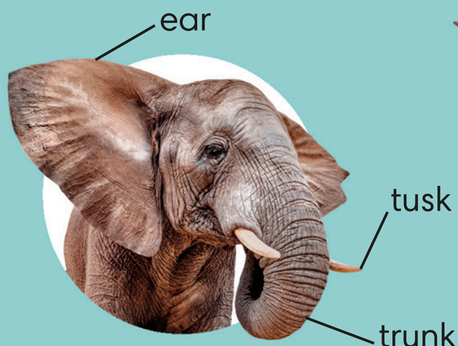

colony of ants

Heads, bodies, and feet

Think of an animal. Imagine its head, body, and feet. Are they the same as yours?

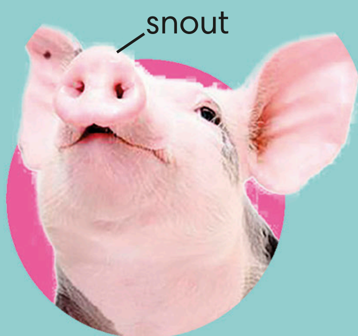
Heads

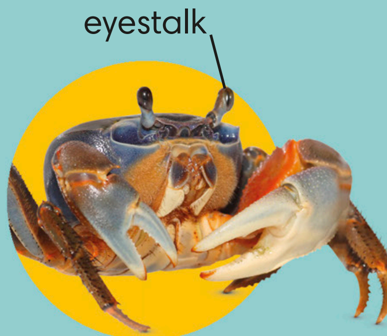
Which animal has the biggest ears?





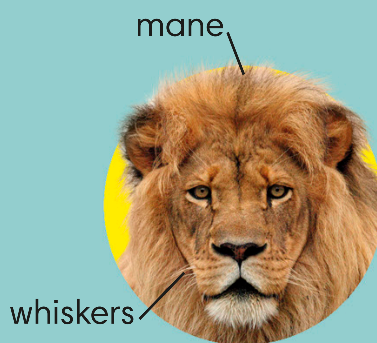


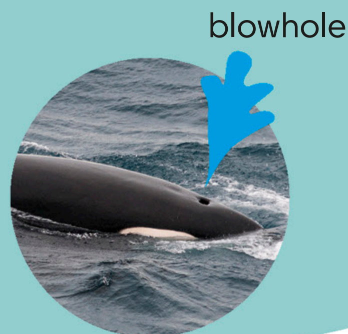




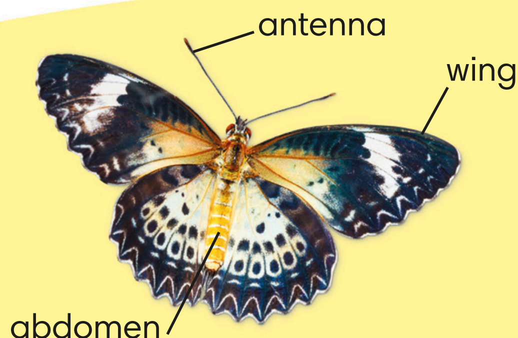














Feet (and hands!)

tube feet



flipper



paws



talons



hooves



sticky pads



prolegs



webbed feet



claws



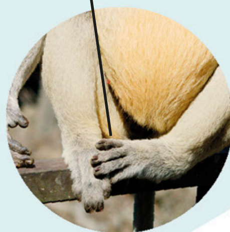
fin



fingers



toes



Why do waterbirds have webbed feet?

Bodies

skin



four-legged

fur



tail

shell



bristles





feathers

exoskeleton (outside skeleton)



endoskeleton (inside skeleton)



Feeding time

What do animals feed on and how do they eat? Let's take a look.

omnivore
(plant and meat eater)

bears

carnivore
(meat eater)

herbivore
(plant eater)

predator

cheetah

vulture

antelope

graze

scavenger
(eater of leftovers)

prey

grass

Food chain

flow of nutrients

All about eating


mouth

bite and chew

Beavers eat leaves, twigs, and bark. They cut wood to make dams.



gnaw

proboscis
(straw-like mouthpart)


nectar

suck



lap

Trap-jaw ants eat other insects.


mandibles
(mouthparts)

ready to snap

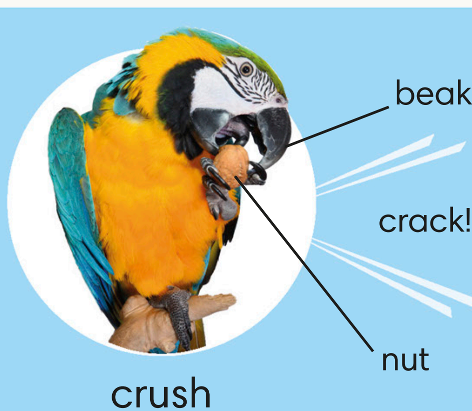
Animals with specialised diets







Can you name another baby animal that feeds on its mother's milk?



crush

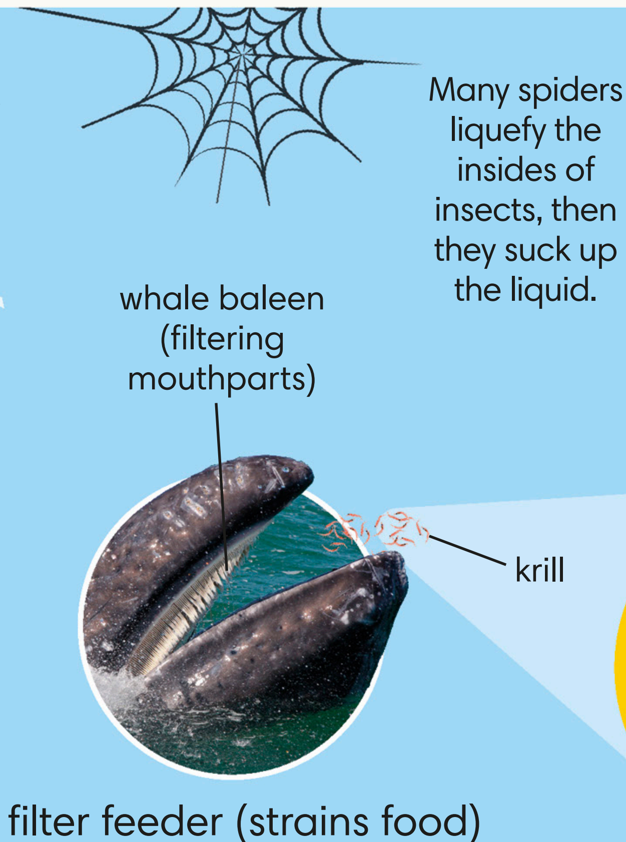
Many spiders liquefy the insides of insects, then they suck up the liquid.



liquefy



suckle



filter feeder (strains food)

Communicating

Zoologists can't talk to animals, but they can understand some of their messages. Can you?

Communicating over long distances



low-pitched sound



birdsong

Marking territory



scent marking



alarm call

Communicating danger



thumping

posture



rearing up

hair on end



Showing fear or strength



growling

warning of attack



howling

Communicating "I'm here"



cheep cheep

call

Showing friendship



grooming

Showing where food is

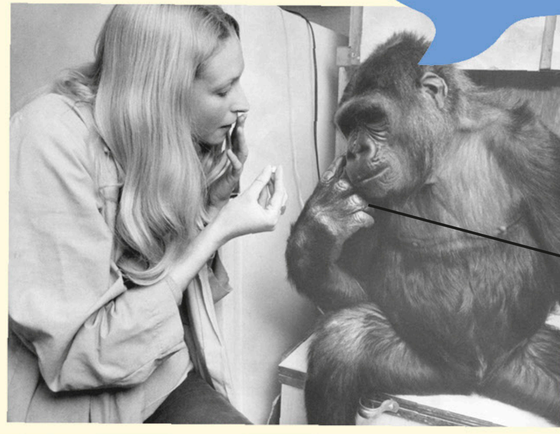
Ants leave a scent trail.





Bees waggle dance (to tell other bees where there are flowers).

Communicating with humans



Koko the gorilla

sign language

Communicating "let's play!"



play bow

A male bird of paradise puts on a display.



A male cricket chirps.

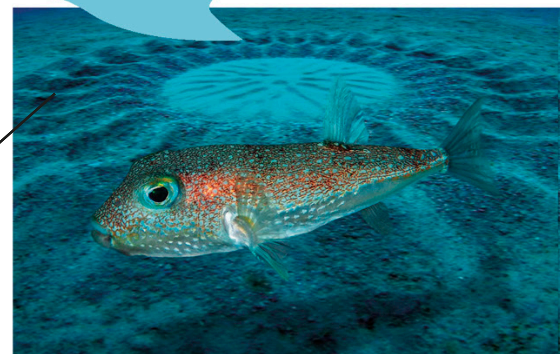


Attracting a mate

Many male birds sing to impress a mate. Some female birds sing, too.



A male pufferfish creates a nest ready for a female's eggs.



Which animal wags its tail to show different emotions?

Animal comparisons

Big or small, wild or tame, venomous or harmless – just look at all these animal differences!

wild



wolves

tame



cat

domesticated



sheep

fastest on land



cheetah

two of the slowest



snail



sea anemone

What is the biggest animal that walks on land? (Clue: it has a long trunk.)

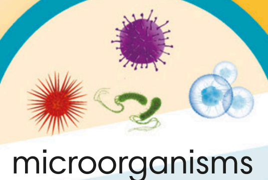
blue whale

biggest

heavy

light

smallest living things



microorganisms

solitary



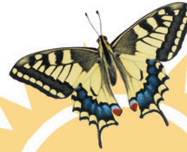
snow leopard

social



dogs

diurnal
(active in the daytime)



butterfly

venomous



viper

harmless



slowworm

eye-catching



bird of paradise

camouflaged



octopus

nocturnal
(active at night)



moth

tall

giraffe

short



mouse

plain



horse

patterned



zebra



fox

omnivore

tiger



carnivore



rabbit

herbivore

Animal clues

Learn to recognise the poo of different animals. Look out for rotting plants, too – these are being eaten by animals and microbes. You might also find evidence of things that lived long ago.

Poo

Poo comes in many shapes and sizes!

Which animal has cube-shaped poo?

rabbit droppings



fox poo



bird dropping



lizard poo



wombat poo



Rotting plants

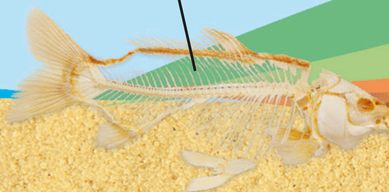
What creatures are eating the log?

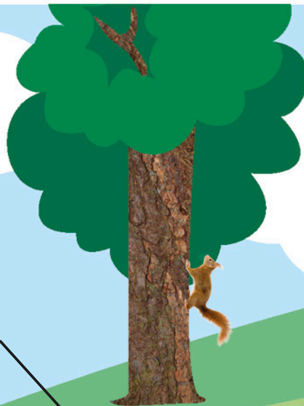


More animal clues











owl pellet



otter spraint



bat guano



wormcast



insect frass



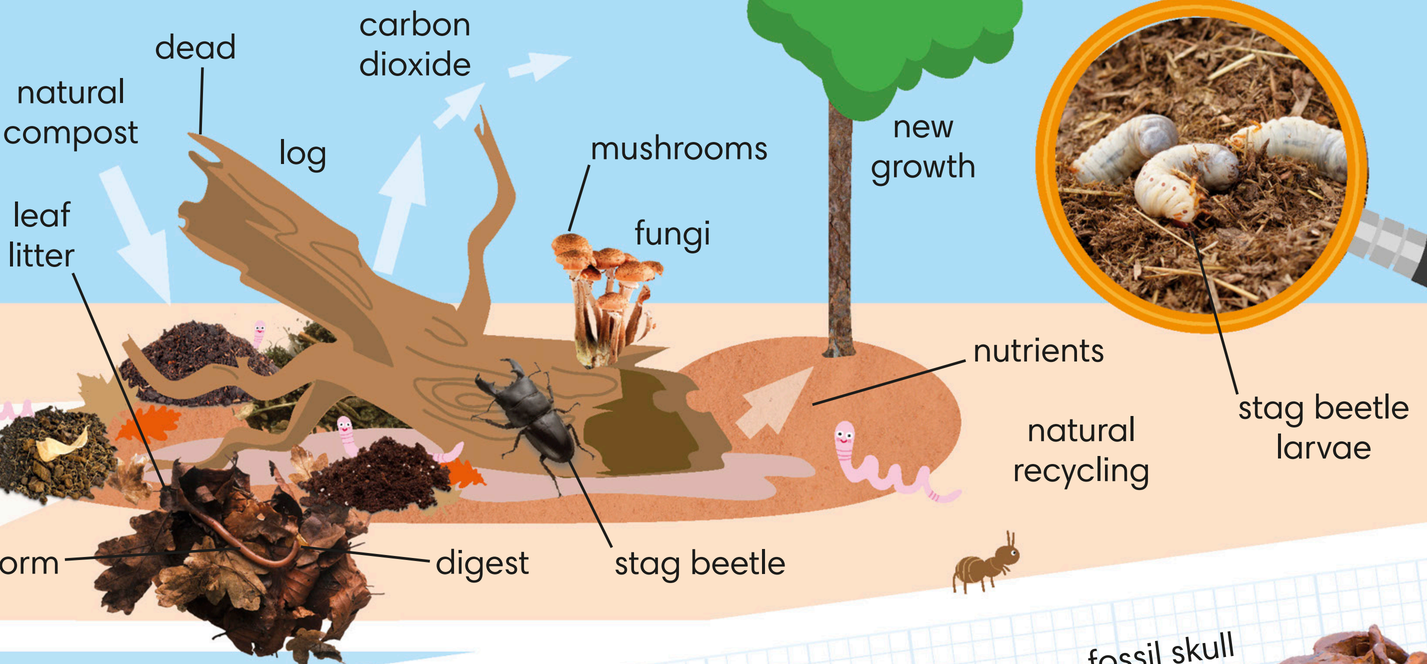
bear scat



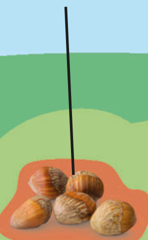


elephant dung





nuts buried by squirrels



Clues from long ago



dinosaur footprint in fossil rock



ammonite (fossil mollusc)



amber (fossil tree resin)

fossil skull





coprolite (fossil poo)

Gardens and parks

There are lots of wonderful things to see and do in a garden or park.



All insects have six legs. Are woodlice crustaceans or insects?



Park





lawnmower

flowers

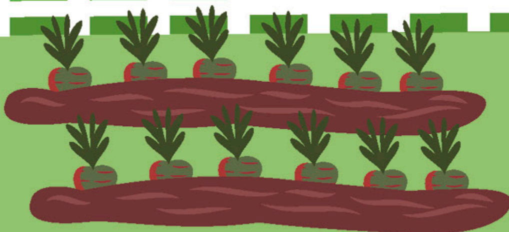
cherry tree



flowerbed

compost bin







seeds

grass

vegetable patch



gardening gloves



garden trowel



earthworm



soil

wheelbarrow



butterfly

pollinator



weeds

snail



snail trail



beetle

Garden

Fields and meadows

Some fields are planted with crops. Others are full of wildflowers. Grassland can be green and grassy or dusty and dry.

barn owl

wildflower meadow

wheat field

straw

grass

horse

sheep

pasture

cow

buzzing

bee

Some arable crops



Can you think of a food you like that contains an arable crop?


osprey



baler

straw bale

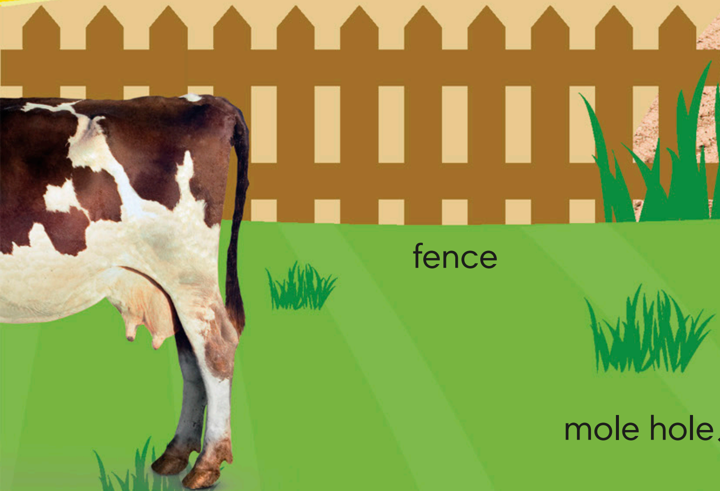


tractor


combine harvester


lizard


plough


fence


grey partridge


field mouse


grasshopper




grass snake

mole hole

mole

clover

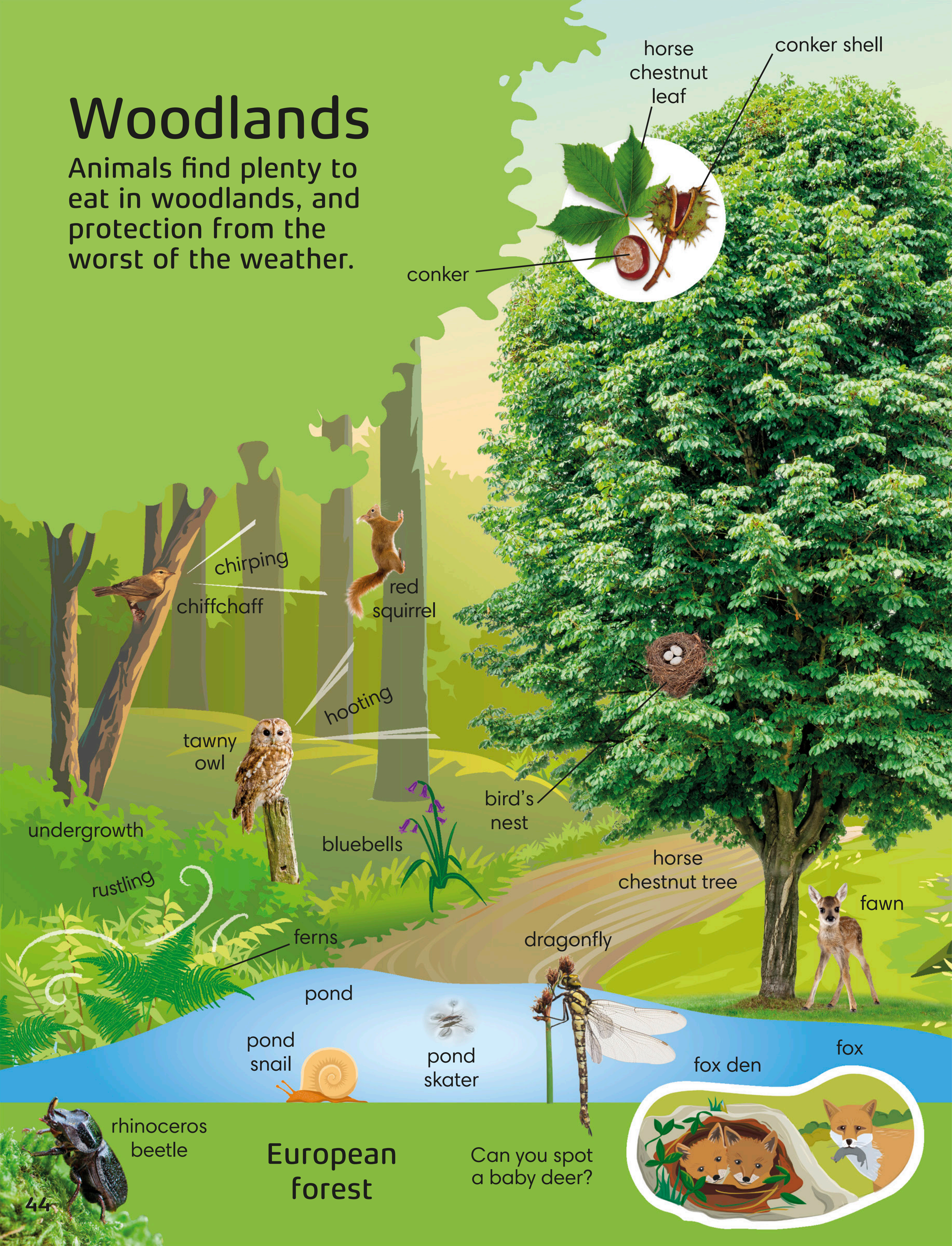
mole burrow

rabbit burrow


wild rabbit

Woodlands

Animals find plenty to eat in woodlands, and protection from the worst of the weather.



American redwood forest

giant redwood tree

lichen

giant redwood cone

giant redwood leaves

bobcat

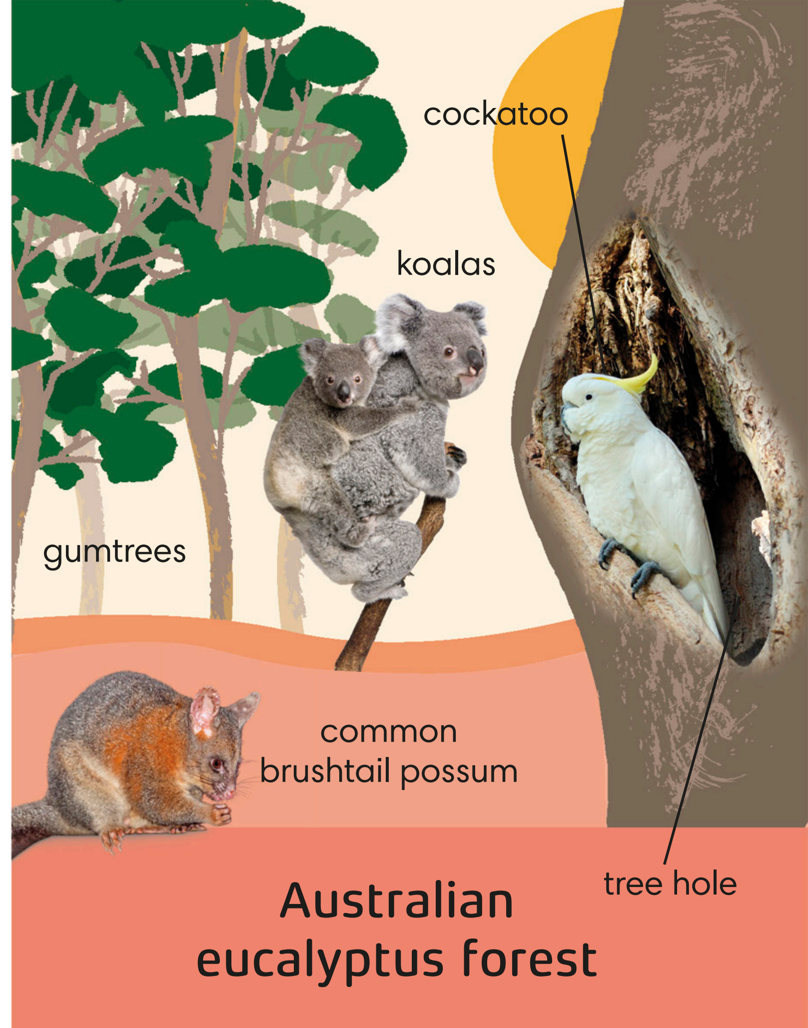
knocking

woodpecker

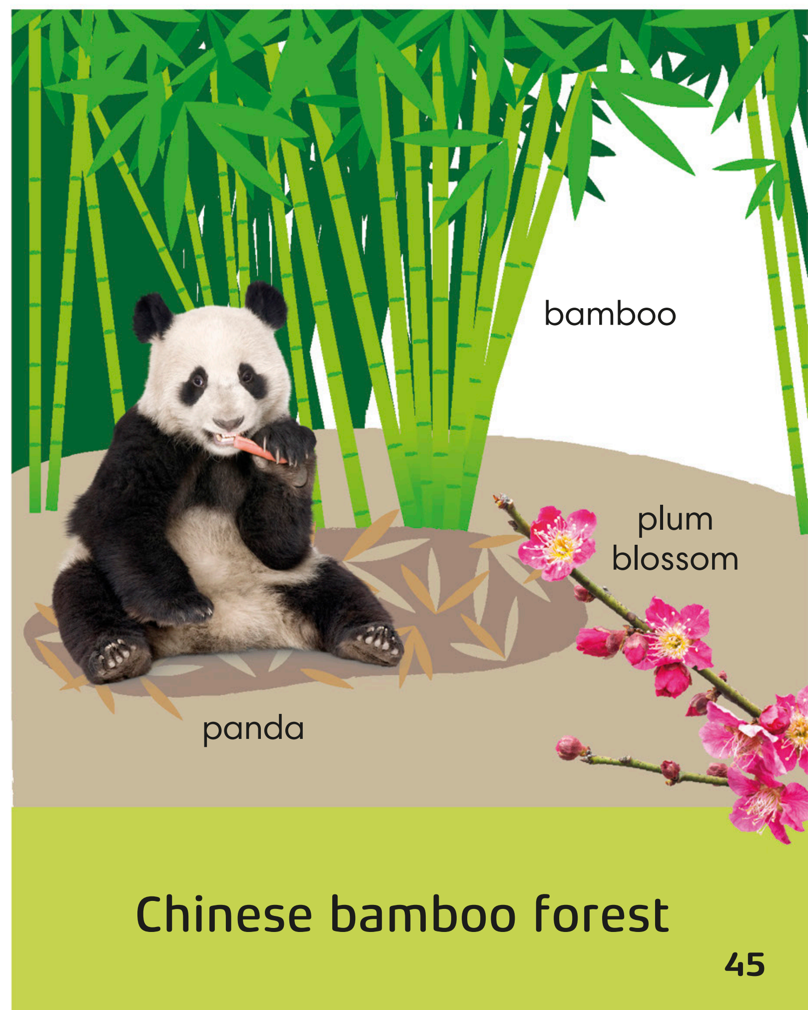
black bear

toadstool

chipmunk



Australian eucalyptus forest



Chinese bamboo forest

Rivers

Animals live in rivers, on riverbanks, and on the flat areas next to rivers, called floodplains.

weeping willow tree

burrow

riverbank

muskrat

fishing

water vole

Canada goose

osprey

fresh water

salmon

moorhen

carp

reeds

mayfly

pondweed

stickleback

crayfish

pike

current

rapids

canoe

Spot the creature in the water that has an exoskeleton (a hard outer skeleton).

wild swimming

swan

duck

heron

dragonfly

otter

beaver

marsh

Where does a river meet the sea?





weir



floodplain



waterfall

Oceans and coasts

Most of Earth's surface is covered with water. That is why it looks blue from space.



wind farm

sand

bay

surf

wave

swim

holiday

dive

Warm, shallow sea

octopus

Which sea animal has five long arms?

swordfish

sea sponge

seahorse

clownfish

dolphin

seaweed

shells

blue crab

coral

mussel

pebbles

sea anemone

brittle star

spiny lobster



NAUTILE

submarine

anglerfish

giant isopod

Deep sea

lion's mane jellyfish

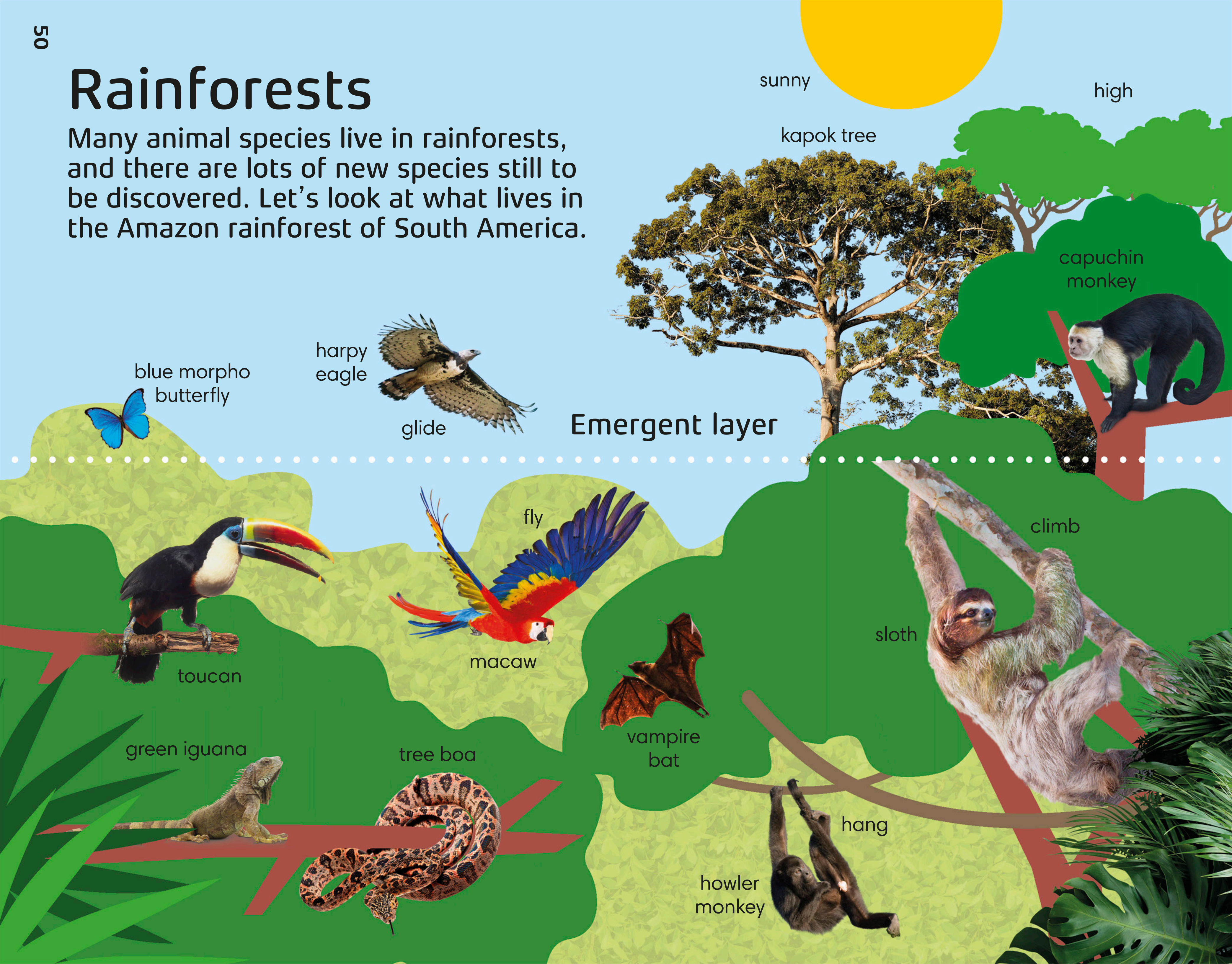
dark

lanternfish

giant squid

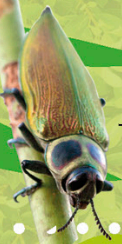
Rainforests

Many animal species live in rainforests, and there are lots of new species still to be discovered. Let's look at what lives in the Amazon rainforest of South America.



What sounds might you hear in a rainforest?

Canopy


jewel beetle


orchid bee


red-eyed tree frog


damp

bananas


orchid


jaguar


cocoa pod

cocoa tree

Understorey


harlequin beetle


armadillo


giant centipede


decay

fungi

nutrient rich


scorpion


giant anteater


churo snail

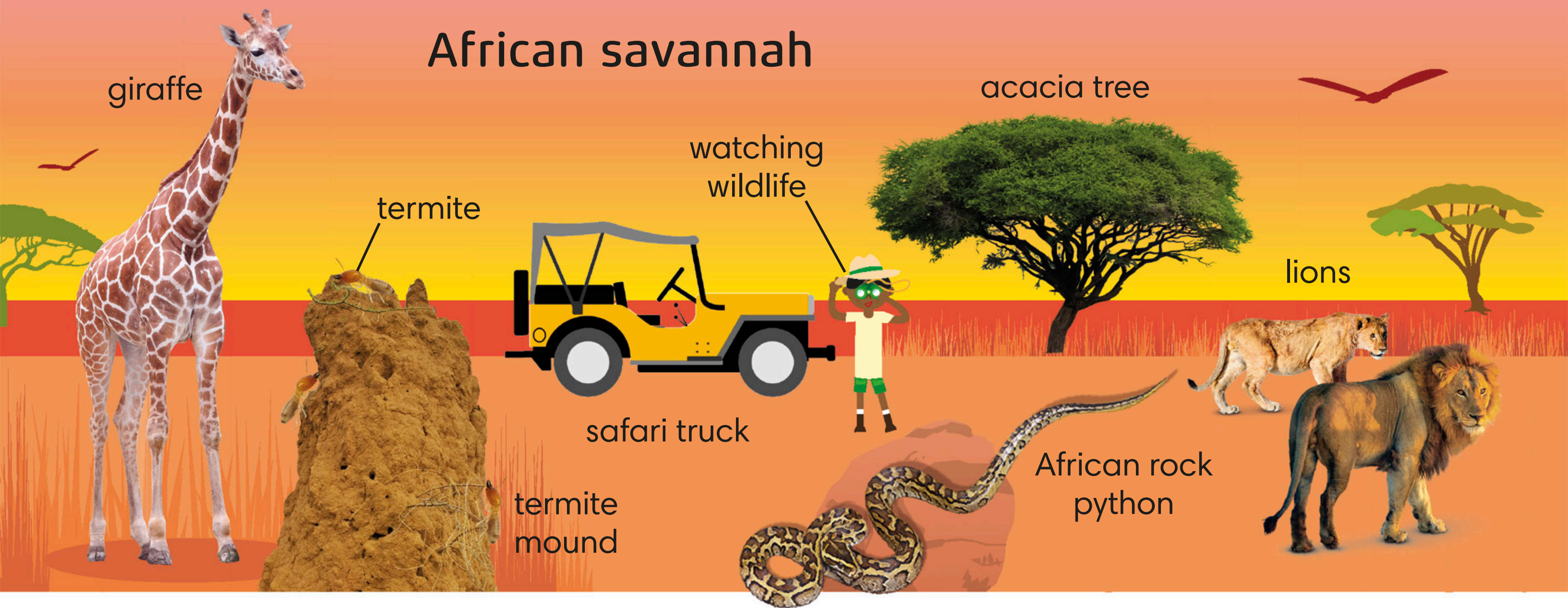
buttress roots

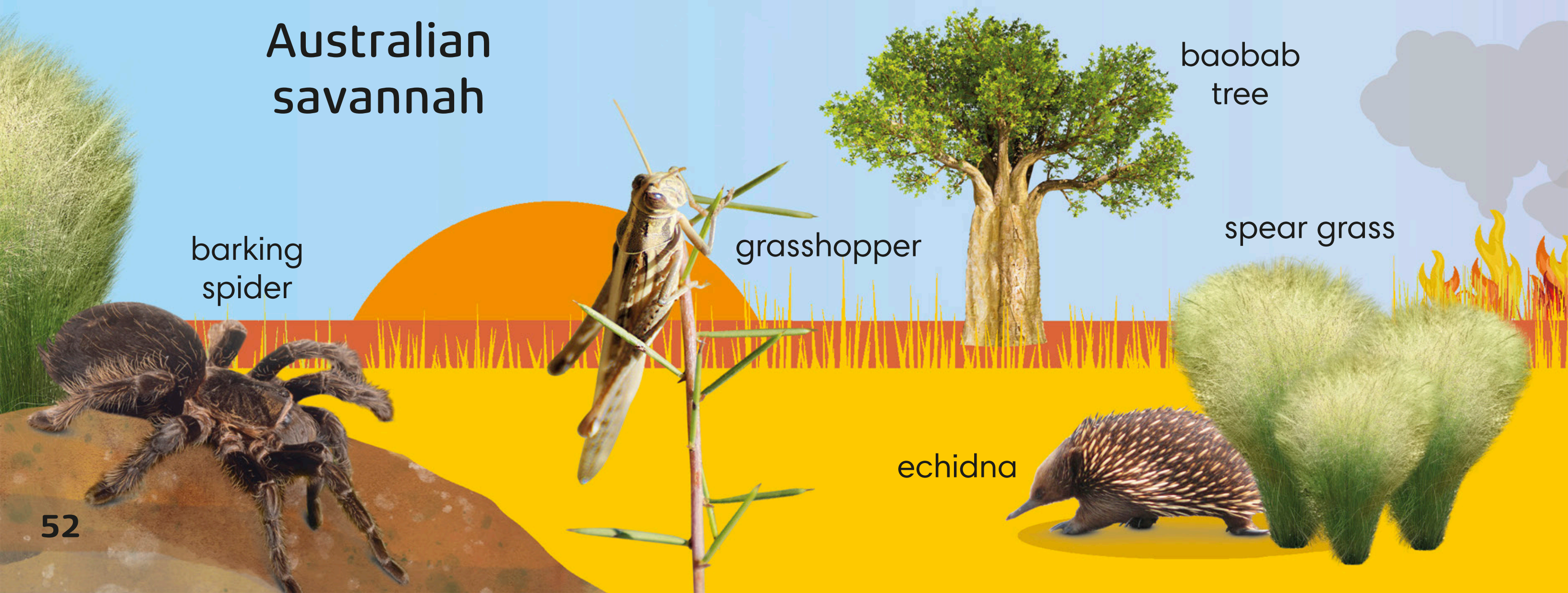

leaf cutter ant

Forest floor

Savannahs

Savannahs are flat grasslands with few trees. There are often wildfires, but plants regrow. Some of the biggest savannahs are in Africa, South America, and Australia.





South American savannah

pampas grass

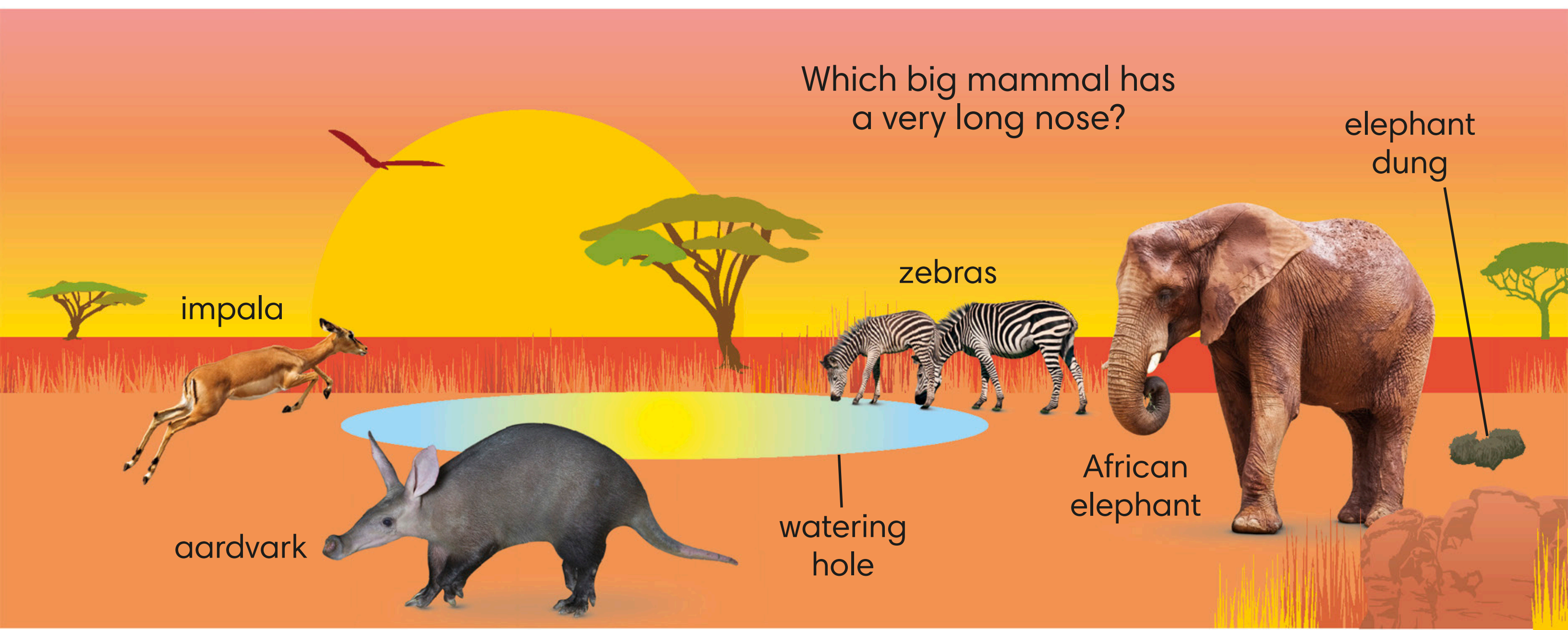
rhea

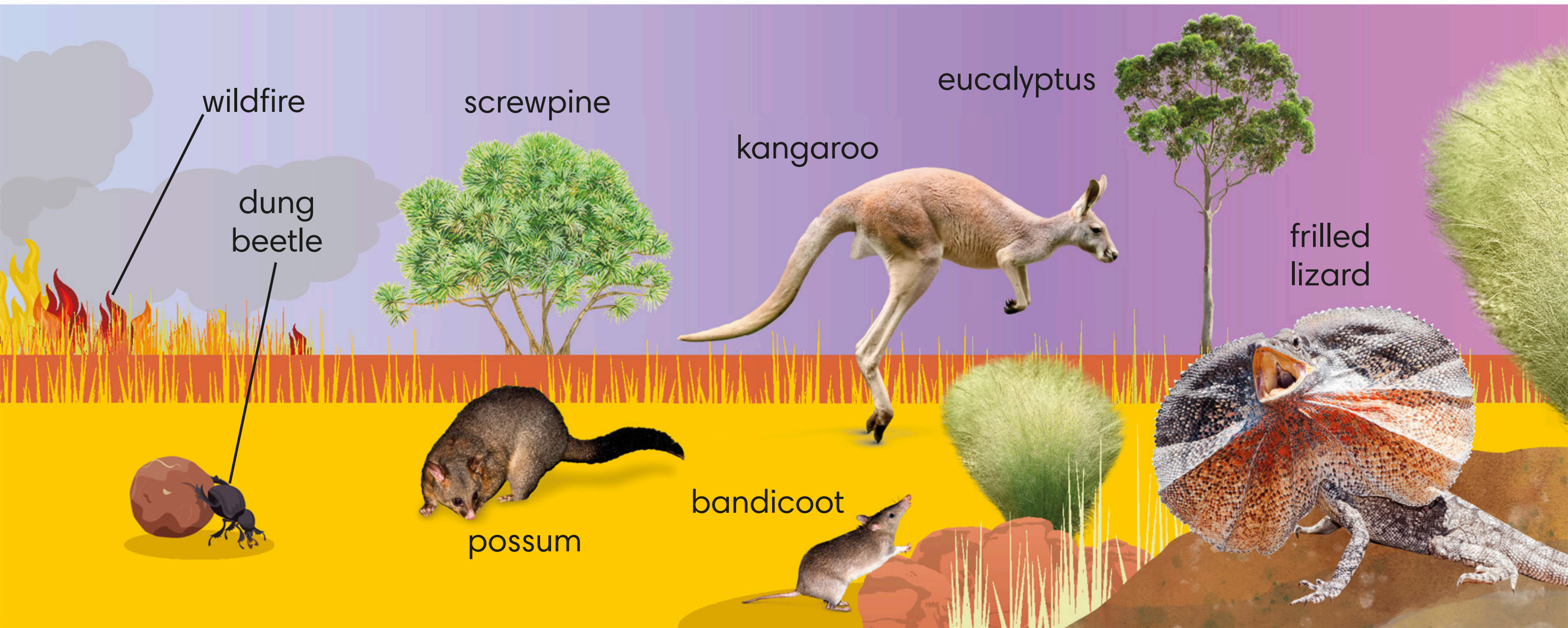
guinea pig

pampas fox

puma

footprints





Deserts

Deserts can be hot or cold, but they all get very little rain. Let's look around the Chihuahuan Desert in Mexico.



red-tailed hawk

hunt

Food chain





hiss

rattle

rattlesnake

flow of nutrients



jackrabbit



prickly pear cactus

What eats what in the food chain?



tumbleweed



coyote



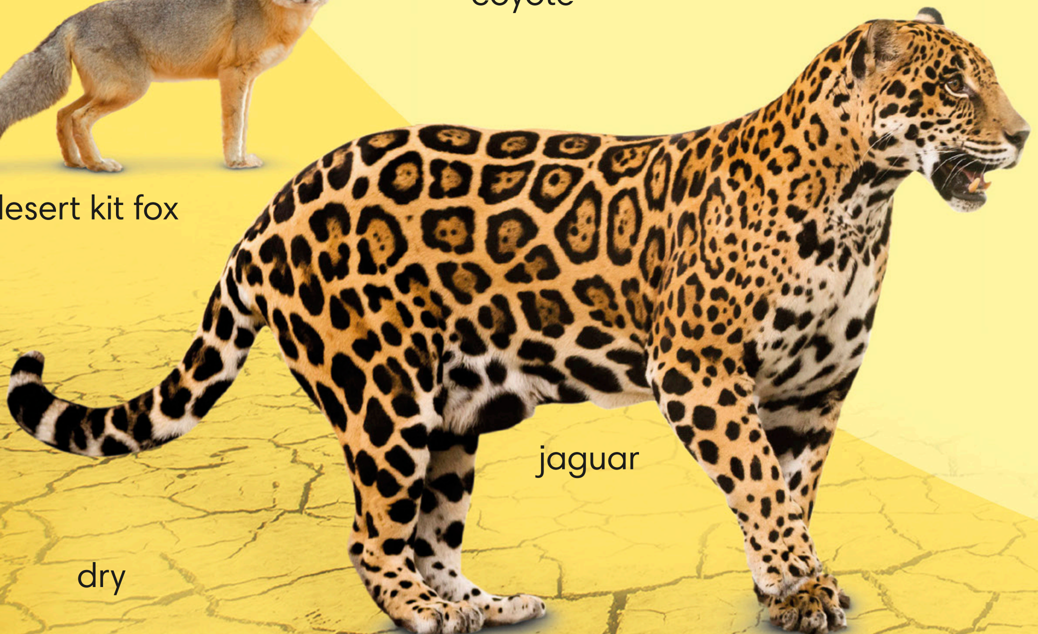
lizard



desert kit fox



barrel cactus



jaguar

dry

sand dune

hot

sun

arid


golden eagle


grasshopper


dust storm


scorpion

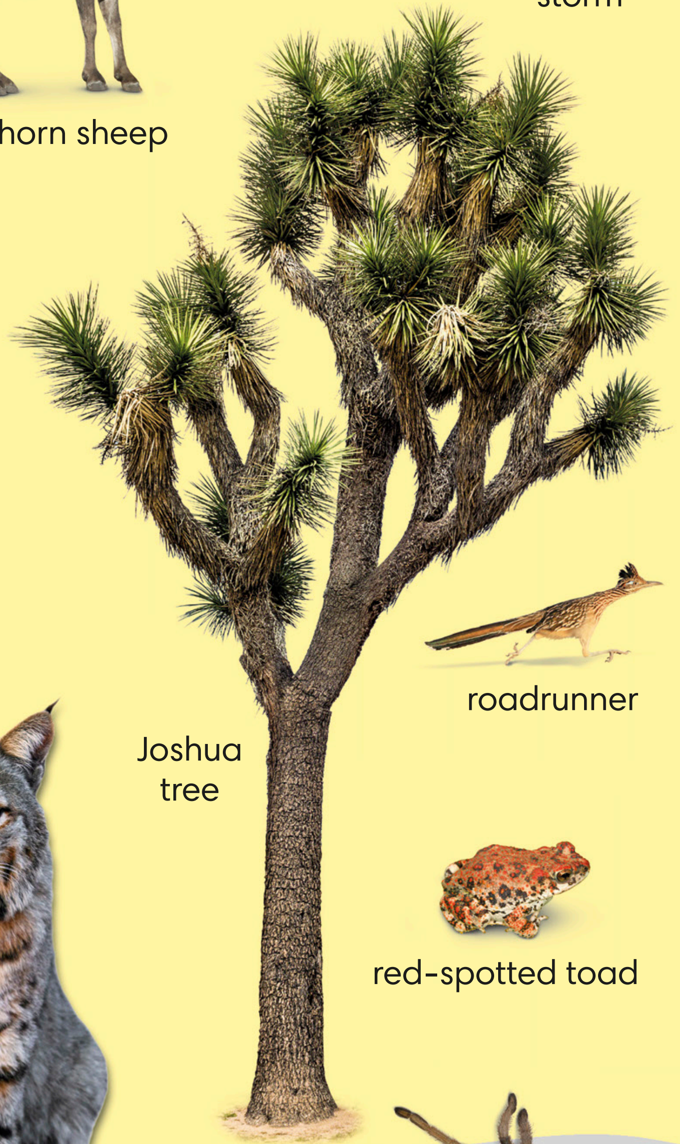
sand


saguaro cactus


bighorn sheep


yucca


aloe


Joshua tree


roadrunner

Find three birds and two reptiles.


bobcat


red-spotted toad


desert ants

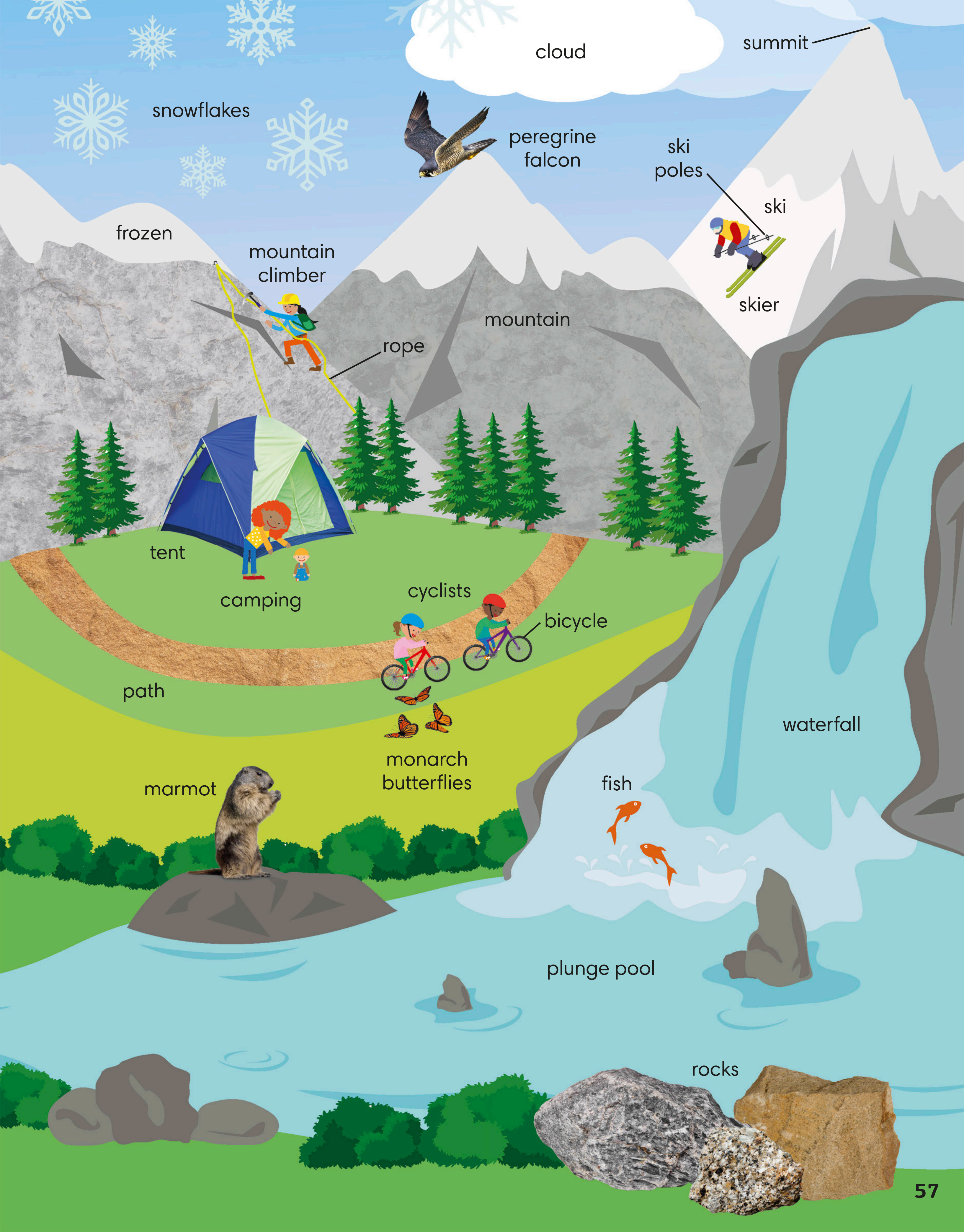
shade


tarantula

Mountains

Mountains are towering lands of earth and stone. It gets colder as you go higher, so mountains are often snowy at the top.




cloud
summit
snowflakes
peregrine
falcon
ski
poles
ski
frozen
mountain
climber
skier
mountain
rope
tent
camping
cyclists
bicycle
path
waterfall
monarch
butterflies
marmot
fish
plunge pool
rocks

Arctic and Antarctic

Some amazing animals and plants have adapted to survive in the freezing polar habitats of the Arctic and the Antarctic.

The wildlife is different in each place. Do penguins live in the Arctic or the Antarctic?

Arctic


Arctic cottongrass


bog bilberry


grayleaf willow


reindeer lichen


snowy owl


walrus


Arctic tern

rocky shoreline


lemming


reindeer


Arctic hare


Arctic fox


polar bear


beluga whale


harp seal

ice

frozen

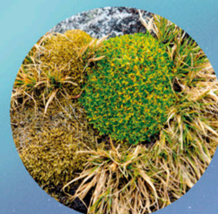

narwhal

Antarctic

polar lights



Antarctic hair grass



Antarctic pearlwort

peak

mountain

snow

valley

wandering albatross



snow petrel



polar desert

iceberg



orca



adelie penguin



krill



leopard seal



Weddell seal

Spot three Antarctic mammals.



emperor penguin



starfish

gentoo penguin



Protecting nature

We should take care of our world. The choices we make can harm or protect nature.

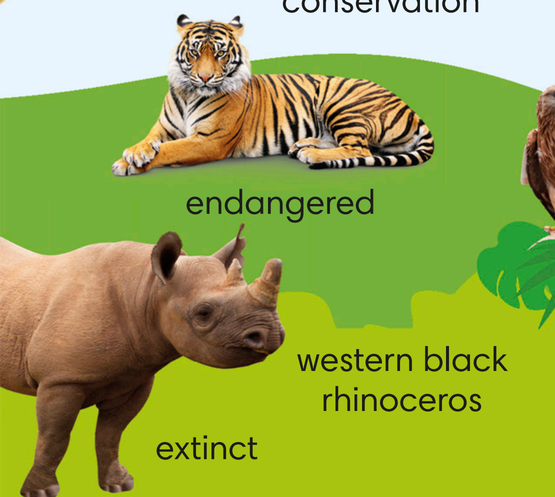
Which of the things on these pages help to protect nature?

Our animals


conservation


protected wildlife reserve


anti-poaching unit


endangered

western black rhinoceros

extinct


reintroduction

kites

caring

seagull


zoo breeding programme

Our farming


battery cage

intensive farming

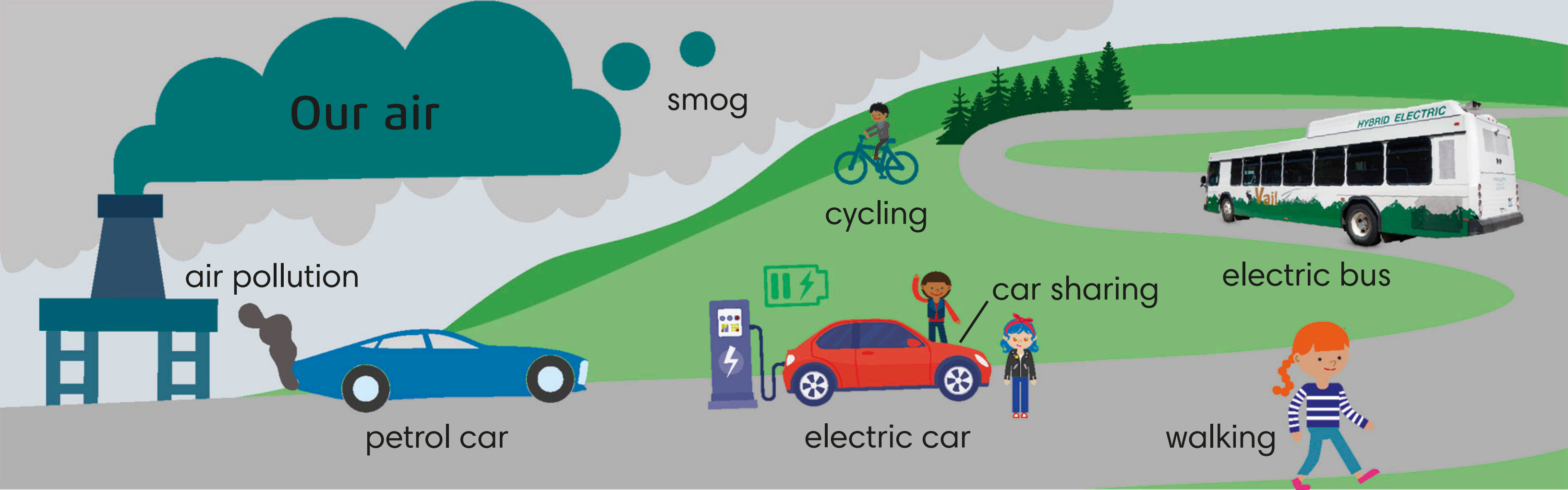

pesticide


crop spraying

No Artificial Chemicals

Organic Farm

Our air

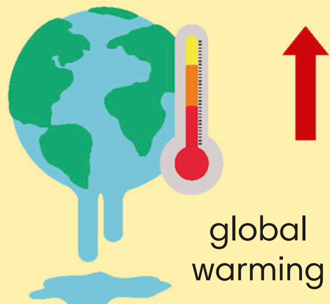


Our trees


deforestation


reforestation

Our climate


global warming


wildfires


floods


polar ice caps melting



Can we do something to help nature today?

Our oceans


ocean litter


cleaning up

Working with nature

There are many ways to work with nature, including jobs in which you can help to protect our planet and the species that live on it.


air quality scientist: checks air pollution


farmer


geologist: studies Earth's rocks


forester: looks after forests

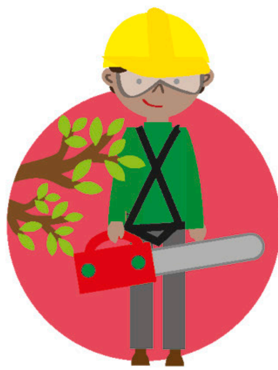

zoologist: studies animals


entomologist: studies insects


environmental scientist: studies the environment


botanist: studies plants


gardener


tree surgeon


zookeeper

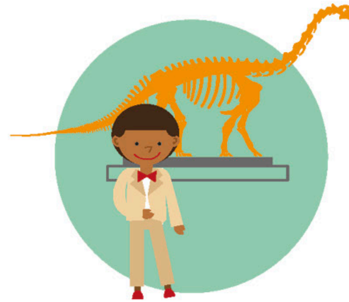

marine biologist: studies ocean life



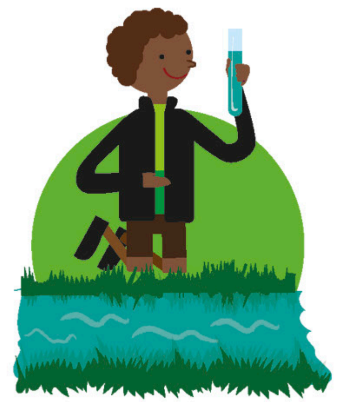
vet



environmental activist: supports protecting the environment



natural history museum event manager



ecologist: studies living things and their environment



street cleaner



wildlife author



wildlife photographer



aquarist: manages an aquarium



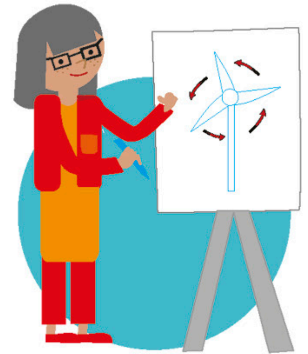
countryside ranger: looks after the countryside



safari guide



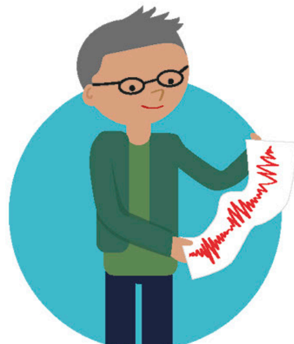
wildlife presenter



environmental engineer: designs things for the environment



animal rescue worker



seismologist: studies earthquakes

Which of these jobs would you like to do?

Acknowledgements

DK would like to thank: Victoria Palastanga and Eleanor Bates for additional design work; Jagtar Singh for additional DTP design work; Adhithi Priya, Sakshi Saluja, Rituraj Singh, Sumedha Chopra, and Vagisha Pushp for additional picture research work; Polly Goodman for proofreading.

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1 123RF.com: Liubov Shirokova (clb). **Dreamstime.com:** Marc Bruxelle (cra); Isselee (tc); Vvoevale (tl); Yinan Zhang (cl); Svetlana Larina / Blair_witch (fclb); Nejron (cb); Sabelskaya (br). **2 Dorling Kindersley:** Tom Grey (cla); Natural History Museum, London (tr). **Getty Images / iStock:** photo5963 (clb). **3 123RF.com:** isselee / Eric Isselee (bc); Prapan Ngawkeaw (cb/road); jackf / Iakov Filimonov (bl/wolf). **Dreamstime.com:** Iakov Filimonov (clb/goat); Phartisan (rock x3); Jpsdk / Jens Stolt (butterflies x 3); Yotrak (cb/tent); Jackf / Iakov Filimonov (bc/reindeer); Nelikz (bl/squirrel). **Shutterstock.com:** Aleksandr Pobedimskiy (clb/sandstone). **6–7 Dreamstime.com:** Gritsalak Karalak (c). **6 Dreamstime.com:** Astrofireball (c). **7 Dorling Kindersley:** Dan Crisp (ca); Natural History Museum, London (crb); James Kuether (cb); Jon Hughes (bc). **Dreamstime.com:** Nicolas Fernandez (c); Markus Gann / Magann (tr). **8 123RF.com:** algre (crb). **Dreamstime.com:** Costasz (bc); Tomasz Śmigla (bc/cups); Vchalup (br); Rui Matos / Rolmat (cra); Rob Wilson / Robwilson39 (cr). **9 123RF.com:** julynx (tl); Martin Spurny (cla); Natthawut Panyosaeng / aopsan (ca). **Alamy Stock Photo:** Mouse in the House (bl). **Dreamstime.com:** Sergey Dzyuba (cr); Elena Kazanskaya (cla/bin); Tele52 (cra); Radha Karuppannan / Radhuvenki (clb/x2); Stockphototrends (bc). **Getty Images / iStock:** DigitalVision Vectors / bubaone (cl); photo5963 (c); youngID (ftl); pterwort (br). **10 123RF.com:** Inna Astakhova (crb); tempusfugit (bc); nerthuz (cb). **Dorling Kindersley:** Tracy Morgan (cb/dog). **Dreamstime.com:** Melanie Hobson (ca/landscape); Nexus7 (t); Isselee (cl); Theo Malings (clb); Eric Isselee (cr). **11 123RF.com:** Aaron Amat (clb/x3); Dmitry Rukhlenko / dimol (fcra). **Alamy Stock Photo:** Justin Kase z12z (fbl). **Dreamstime.com:** Billy Ber (tr); Narathip Ruksa / Narathip12 (ftr); Cammeraydave (cb); Cynoclub (bc); Jeroen Van Den Broek / Vandenbroek29 (bc/GuideDog); PhotoChur (br); Zbynek Burival / Merial (fbr). **Fotolia:** Eric Isselee (bl); Norman Pogson (ca). **Getty Images / iStock:** Mac99 (cra); pifate (crb). **12 123RF.com:** fireflamenco (x3). **Dreamstime.com:** Catalin205 (clb, crb); Vectorikart (cra); Stockoxinoxi (ca); Thomas Holt (cl); Macrovector (clb/net); Photka (br). **13 Dreamstime.com:** Akinshin (tr); Vectorikart (cla); Andreanita (tr/bear); Miramisska (cra); Pavel Rodimov (c/stargazing); Kotenko (c); Gerald Zaffuts (c/storytelling); Christinlola (cr); Sabelskaya (clb); Kellyrichardsonfl (bl); Pavel Naumov (cb/x4); Sergiy Bykhunenko (br); Macrovector (ca). **14 Dreamstime.com:** Andreiuc88 (cb); Antares614 (c); Nehru (br). **15 123RF.com:** Rune Kristoffersen (cla). **Dreamstime.com:** Mihai Andritoiu (cb); Mishoo (tl); Artisticco Llc (tr). **16 123RF.com:** justoomm (bc); Kitsadakron Pongha (cra); nasaimages (c/cyclone). **Alamy Stock Photo:** Mike Hill (c). **Dreamstime.com:** Arevhamb (bl); Andrey Armyagov (cla); Hulv850627 (cl); Justin Hobson (cr); Trekandshoot (clb); Thescv (cb); Elantsev (crb); Ruthchoi (br). **17 123RF.com:** alicenerr (c). **Alamy Stock Photo:** SPUTNIK (cra). **Dreamstime.com:** Giuseppe Di Paolo (ca); Siempreverde22 (cla); Dmitry Pichugin / Dmitryp (ca/Everest); Valore (cl); Unissunil (c/Mawsynram); Jon Chica Parada (cr). **Getty Images:** Daniel Osterkamp (bc). **Getty Images / iStock:** Jorge Villalba (bl). **18 123RF.com:** Ruth Jenkinson / stevanzz (bl); Andrzej Tokarski / ajt (tc); Przemyslaw Koch (fclb). **Dorling Kindersley:** Liberty's Owl, Raptor and Reptile Centre, Hampshire, UK (crb); Thomas Palmer (cb). **Dreamstime.com:** Digitalimagined (clb/liverwort); Anna Sedneva / Sedneva (clb/grass); Vitalssss (c); Sarah2 (crb/tick); Ildar Galeev (bc). **Fotolia:** Karl Bolf (fcrb). **Getty Images / iStock:** Antagain (clb). **19 123RF.com:** smileus (tc); Pavlo Vakhrushev / vapi (cla); Ten Theeralerttham / rawangtak (cl); Thawat Tanhai (bl). **Dreamstime.com:** Conchasdiver (clb); Lgor Dolgov / Id1974 (tr); Ronniechua (c); Kotomiti_okuma (cb); Kazoka (cr). **20 Dreamstime.com:** Cherdchai Chaivimol (cb/bud); Vaclav Volrab (cla); Kaiwut Niponkaew (ca); Tomboy2290 (cra/Basil); Natali572 (cra); Ppy2010ha (clb); Dewins (bc); Lepas (bl); Oleg Dudko (fbl); Bogdan Lazar (cb); Songyuth Unkong (crb); Mikhail Dudarev (br). **21 123RF.com:** Anna Liebiedieva / utima (cl); olegdudko (c/Kiwi). **Dorling Kindersley:** Neil Fletcher (cra). **Dreamstime.com:** Anton Ignatenco (c); Zerbor (cla); David Ridley (ftl); Paul Rookes (tl); Zerbor (fcla); Natika (clb); Elena Schweitzer / Egal (cb); Roman Ivaschenko (bl); Roman Ivaschenko (bl/seaweed); Vetre Antanaviciute-meskauskiene (bc). **Getty Images / iStock:** DNY59 (fcra). **Shutterstock.com:** Daydreamr Digital Studio (tr). **22 Dorling Kindersley:** Centre for Wildlife Gardening / London Wildlife Trust (ca). **Dreamstime.com:** Marc Bruxelle (cl); Vvoevale (cla); Pipa100 (clb); Dreamstock (cb); Filmfoto (bl); Anatoliy Mandrichenko (bc). **22–23 Dreamstime.com:** Andreykuzmin (b); Zerbor (c). **23 Dreamstime.com:** Denira777 (cra); Anton Ignatenco (tr); Ievgenii Tryfonov (bc); Setory (br); Majormetts (crb); Zorica Vitanovic (ca). **24 Dreamstime.com:** Domnitsky (ca); Md. Rakibul Hassan (sunflower life cycle); Ilonai (tr). **25 Dreamstime.com:** Elena Elisseeva (cr); Nadiia Havryliuk Kharzhevska (bl/mushroom cycle); Luayana (tl/apple tree life cycle); Angelo Gilardelli (tr); Lenazajchikova (crb); Pavel Rodimov (br); Wirestock (clb); Thawats (cla). **26 123RF.com:** Aleksandr Ermolaev (cr). **Dreamstime.com:** Anankkml (bc); Photodeti (ca); Wirestock (br). **Fotolia:** Mark Higgins (fbr). **Getty Images / iStock:** LUNAMARINA (bl). **27 Alamy Stock Photo:** SConcepts (bl). **Dreamstime.com:** Jason W. Baker (tl); Isselee (cra); Svetlana Larina / Blair_witch (ftl); Pimmimemom (tc); Stevenrussellsmithphotos (ca, fcla); Vasiliy Vishnevskiy (cl); Isselee (cr); Cinnamongirl (crb). **Science Photo Library:** Claude Nuridsany & Marie Perennou (tr). **Shutterstock.com:** Lamnoi Manas (cb). **28 123RF.com:** Anna Utekhina (bc). **Dreamstime.com:** Accept001 (c); Isselee (bc/dalmatian); Judith Dzierzawa (br); Alexander Potapov (clb); Isselee (clb/sheep); Alexander Potapov (cra); Isselee (cra/cow); Tristana / Kseniya Abramova (ca); Isselee (cla). **Fotolia:** Anatolii (cb); Olena Pantiukh (crb). **Getty Images:** mikroman6 (bl). **29 123RF.com:** Cathy Keifer (tc); smileus (tr). **Alamy Stock Photo:** Lee Dalton (clb). **Dorling Kindersley:** British Wildlife Centre, Surrey, UK (cla). **Dreamstime.com:** Linda Caldwell (bl); Toby Gibson (bc); Dizzizzmee (ca); Paul Farnfield (fcla); Steve Oehlenschlager (tl); Brett Hondow (tc/wolf spider). **Fotolia:** Eric Isselee (c). **Getty Images:** Photodisc / Don Farrall (ftl). **30 123RF.com:** Visarute Angkatavanich (br). **Dreamstime.com:** Adogslifephoto (cla); Sutisa Kangvansap (bc); Prin Pattawaro (bl); Graeme Snow (crb); Billybruce2000 (cb); Marcin Wojciechowski (cr); Joanna Zopoth Lipiejko (c); Sonsedskaya (cl); Isselee (cra); Gianluca Piccin (ca). **Getty Images / iStock:** RAUSINPHOTO (clb). **31 Dreamstime.com:** Mira Agron (fcl); Sebastian Kaulitzki (br); Pavel Trankov (bc); Steve Allen (bl); Isselee (crb); Isselee (cb); Isselee (clb); Gualberto Becerra (cr); Marco Tomasini (cl); Duncan Noakes (fcra); Wrangel (cra); Melinda Fawver (ca); Svetlana Foote (cla); Dirk Ercken (fcla); Jacoba Susanna Maria Swanepoel (ftr); Wildlife World (tr); Jagodka (tc); Alexandercreator (tl); Reimarg (ftl). **32 123RF.com:** ksena32 / Oksana Tkachuk (cra/chamomile). **Alamy Stock Photo:** Jason Bazzano (br); mauritius images GmbH / Kurt Madersbacher (crb). **Dreamstime.com:** Andreanita (cra); Jose Manuel Gelpi Diaz (cra/vulture); Valentyna Chukhlyebova (ca, cr); Hwongcc (cla, c); Golfxx (cb); Marazem (bc); Dmitry Potashkin (bl); Pop Nukoonrat (sky). **33 Dreamstime.com:** Kharis Agustiar (cr); Jocrebbin (bc); Zedcreations / SACHITH (webs x2); Geerati (cra); Duncan Noakes (cla). **Getty Images:** The Image Bank / Joe McDonald (bl). **Getty Images / iStock:** Parrotstarr (clb); superjoseph (ca); pixhook (ca/bamboo). **34 123RF.com:** Isselee Eric Philippe (c). **Alamy Stock Photo:** Arterra Picture Library / Clement Philippe (br). **Dreamstime.com:** Callipso88 (cr); Vasyl Helevachuk (clb); Dizm (cb); Isselee (crb); Wildlife World (ca); Corey A Ford (cla). **Getty Images:** Photodisc / Don Farrall (bc). **Shutterstock.com:** A.Mac.Photo (cl). **35 123RF.com:** John McAllister (cl); utima (ca). **Alamy Stock Photo:** Bill Coster (c); Pally (br); Les Gibbon (bl). **Dreamstime.com:** Angel Luis Simon Martin (crb); Sergeyoch (clb). **Getty Images:** Hearst Newspapers / San Francisco Chronicle (cra). **Getty Images / iStock:** LuckyTD (tc). **36 123RF.com:** swavo (br); Andrzej Tokarski / ajt (c). **Dorling Kindersley:** Natural History Museum, London (cr). **Dreamstime.com:** Isselee (clb); Alexander Konoplyov (br/bacteria); Stu Porter (cra); Mrrphotography (tl). **Getty Images / iStock:** bbevren (b). **37 123RF.com:** Eric Isselee (crb). Ardea: ar / Science Source / Tom McHugh (cl). **Dorling Kindersley:** Natural History Museum, London (c); Jerry Young (bl); Wildlife Heritage Foundation, Kent, UK (tl). **Dreamstime.com:** Isselee (clb); Jblackstock / Justin Black (cb); Yves Sautter (c/octopus). **38 123RF.com:** Eric Isselee (crb). **Dreamstime.com:** Nchuprin / Andrey Sukhachev (crb/bacteria); Angelique Nijssen (bl); Thatsaphon Saengnarongrat (tr). **38–39 Dreamstime.com:** Andreykuzmin (soil); Smishko (sand texture). **39 123RF.com:** Sayompu Chamnankit (bc/footprints). **Alamy Stock Photo:** Rosanne Tackaberry (br). **Dorling Kindersley. Dreamstime.com:** Andreykuzmin (b); Dijarm (br/graph); Kosmos111 (crb); Сергей Кучугурный (bl); Tamara Kulikova (cb); Hommalai (tc); Dave Nelson (ca); Thanthip Homsansri (cla); Lcrms7 (c); Sripfoto (cl); Typsiaod (clb). **Shutterstock.com:** Mikkola (cr). **40 123RF.com:** alekss / Alexandr Pakhnyushchyy (bl); Anatolii Tsekhmister (cra). **Alamy Stock Photo:** Don Despain (clb). **Dorling Kindersley. Dreamstime.com:** Chernetskaya (fcrb); Uros Petrovic (br); Pzaxe (bc); Loren File (crb); Ivonne Wierink (fcrb/pots); Jgade (cla). **Shutterstock.com:** Artiste2d3d (fcra). **41 Dreamstime.com:** Nikolay Antonov (clb/worm); Kristof Lauwers (br); Pimmimemom (crb); Aleksandr Volkov (clb); Fibobjects (cb); Luceluceluce (clb/soil); Atlasfotoreception (crb/gloves); Boulanger Sandrine (cr); Bundit Minramun (cla); Sergiy1975 (cla/lawn mower). **42–43 Dreamstime.com:** Miriam Doerr (flower x3); Eugenesergeev (grass); Miriam Doerr (wild flowers x3); Supertrooper (c). **42 123RF.com:** peterwaters (clb/bee). **Alamy Stock Photo:** Life on white (cla/horse). **Dorling Kindersley:** Mark Hamblin (cra). **Dreamstime.com:** Animaflora (cb); Tazzymoto (ca); Brett Critchley (cla); Isselee (c); Dzmitry Shpak (fcrb); Inna Kyselova (crb); Nipaporn Panyacharoen (cb/barley); Thawats (bc). **Shutterstock.com:** Volosina (clb). **43 Alamy Stock Photo:** Islandstock (cla). **Dorling Kindersley:** Twan Leenders (cb/snake). **Dreamstime.com:** Tony Bosse (tr); Mickem (bc); Tchara (cb); Chuyu (clb); Sandra Standbridge (crb); Isselee (c); Romica (cra); Palians (cra/harvester); Mariya Kondratyeva (cra/land). **44 123RF.com:** Eric Isselee (c). **Alamy Stock Photo:** Imagebroker / Arco / J. Fieber (bl). **Dorling Kindersley:** Roger Tidman (cl). **Dreamstime.com:** ActiveLines; Macrovector (clb); Isselee (crb); Stephanie Frey (cr); Zerbor (r); Atman (tc); Mille19 (clb/owl). **Getty Images / iStock:** MarkMirror (cb). **45 123RF.com:** Eric Isselee (cra/koala). **Dreamstime.com:** Karen Black (cra); Alexander Potapov (bc); Susan Sheldon (bl); Geoffrey Kuchera (bl/bear); Donyanedomam (clb); Lunamarina (cla); David Steele (ca). **Getty Images / iStock:** GlobalP (cb). **Shutterstock.com:** aphotostory (crb). **46–47 Dreamstime.com:** David Watson (bc). **Shutterstock.com:** xpixel (cane x5). 46 123RF.com: Stanko Mravljak (crb/mayfly). **Dorling Kindersley. Dreamstime.com:** G3miller / Gordon Miller (cr); Zerbor (tr); Eduard Kyslynskyy (ca); Dennis Jacobsen (c); Kevin Wells (cb); Photophreak (crb); Roman Ivaschenko (bl). **Shutterstock.com:** Igor Podgorny (cla). **47 123RF.com:** Stefan Holm (clb/dragonfly); NewAge (cl). **Dorling Kindersley:** Roger Tidman (c). **Dreamstime.com:** Natalya Aksenova (ca); Sova004 (br); Ilyas Kalimullin (crb); Kobchaima (cra); Wirestock (tr); Jnjhuz (clb); Zeytun Images (cb). **48–49 Getty Images / iStock:** photo5963 (ca). **48 Alamy Stock Photo:** Doug Perrine (cr); SBS Eclectic Images (cb); Carsten Reisinger (crb); WaterFrame_dpr (clb). **Dorling Kindersley:** Natural History Museum, London (bl); Linda Pitkin (cl). **Dreamstime.com:** Kevin Panizza (fclb); Pipa100 (cb/lettuce); Harvey Stowe (cra). **Fotolia:** uwimages (crb/anemonefish). **49 123RF.com:** feathercollector (cr). **Alamy Stock Photo:** Minden Pictures / Norbert Wu (c). **Dorling Kindersley:** Tom Grey (tc). **Dreamstime.com:** Robertlasalle (clb). **naturepl.com:** Solvin Zankl (clb/lanternfish). **50–51 Dreamstime.com:** Surachet Khamsuk. **50 123RF.com:** Hal Brindley (tc); Hal Brindley (fcra). **Alamy Stock Photo:** Ivan Kuzmin (tr); Nature Picture Library / MYN / Andrew Snyder (crb); Nature Picture Library / Nick Garbutt (cb/eagle). **Dreamstime.com:** Carlosphotos (bc); Nejron (cb); Chansom Pantip (ftr); Arindam Ghosh (cra). **naturepl.com:** Luiz Claudio Marigo (cla). **51 123RF.com:** anankkml / Anan Kaewkhammul (cb/jaguar); Ajay Bhaskar (r). **Alamy Stock Photo:** Zizza Gordon Insect collection (bl). **Dreamstime.com:** Beautifulblossom (tr); Ryszard Laskowski (bc); Gan Chaonan (br); Whiskybottle (bc/orchid); Isselee (crb); Olga Soe (red flowers x3); Thenatureguy1 (clb); Morley Read (crb/scorpion); Vlad Ivantcov (c); Superoke (cla); Douglas Delgado (cra); Ekays (tl); Waraphot Wapakphet (tl/leaves). **naturepl.com:** Gabriel Rojo (cb). **52 123RF.com:** waldemarus (bc/baobab). **Dreamstime.com:** Bennymarty (crb); Yinan Zhang (cl); Snehitdesign (c); Alexander Shalamov (cr); Kewuwu (c/tree); Fritz Hiersche (bc); Svetlana485 (br); Alexandr Yurtchenko (tc). **naturepl.com:** Piotr Naskrecki (clb/ant 1, clb/ant 2, clb/ant 3). **53 Alamy Stock Photo:** Ken Griffiths (br). **Dorling Kindersley:** Blackpool Zoo (clb); Wildlife Heritage Foundation, Kent, UK (cra). **Dreamstime.com:** Anekoho (cr); Lev Kropotov (crb); Pokec / Jan PokornÃ (cb); Birdiegal717 (bc); Izanbar (bc/possum); Godruma (bl); Johan63 / Johannes Gerhardus Swanepoel (cl); Luca Santilli (c); Vicspacewalker (cla); Luciano Queiroz (ca); Rafael Cerqueira (cla/guinea pig). **54 123RF.com:** cookelma / Andrey Armyagov (b); Anan Kaewkhammul / anankkml (br). **Alamy Stock Photo:** George Brice (bl); Robert Shantz (cb); Mike Lane (cra). **Dorling Kindersley:** Andy and Gill Swash (cr). **Dreamstime.com:** Steve Byland (tl); Derrick Neill (clb); Eutoch (fcr); Eutoch (fcra); Isselee (cla). **55 123RF.**com: alhovik (fcra); Natalie Ruffing (cr); sladerer / Scott Laderer (ca); Ufuk Zivana (ca/cactus). **Alamy Stock Photo:** Arterra Picture Library / Clement Philippe (bc); Nature Picture Library / John Abbott (bl); Rick & Nora Bowers (crb). **Dreamstime.com:** Dfikar (clb); Frank Fichtmueller (fcrb); Skynetphoto (cra); Domnitsky (c); Withgod / Alexander Podshivalov (tl); Vally (cla). **56–56 Dreamstime.com:** Phartisan (rock x4). **56–57 Shutterstock.com:** Aleksandr Pobedimskiy (br/sandstone x2). **56 123RF.com:** jackf / Iakov Filimonov (cb). **Alamy Stock Photo:** Niebrugge Images (br); Paulette Sinclair (cb/bear); Ronald S Phillips (bc). **Dreamstime.com:** Jim Cumming (cra); Jackf / Iakov Filimonov (crb); Iakov Filimonov (ca); Nelikz (clb). **57 123RF.com:** isselee / Eric Isselee (clb); Prapan Ngawkeaw (cl). **Dreamstime.com:** Jpsdk / Jens Stolt (butterflies x3); Yotrak (cla). **Shutterstock.com:** Yes058 Montree Nanta (br/granite). **58 Alamy Stock Photo:** All Canada Photos / Wayne Lynch (fclb); Dembinsky Photo Associates / Alamy / Dominique Braud (cb); Bob Gibbons (cra); Realimage (cla). **Dorling Kindersley:** Jerry Young (crb). **Dreamstime.com:** Devon Crosby (bl); Planetfelicity (br); Luna Vandoorne Vallejo (bc); Grafner (b); Outdoorsman (fcrb); Uhg1234 (clb/reindeer); Zanskar / Vladimir Melnik (cla/walrus); Luis Leamus (cr); Il`mar Idiyatullin (fcra); Troyka (ca). **Getty Images / iStock:** Karyn Schiller (fcla). **59 Alamy Stock Photo:** era-images / Colin Harris (tr); Minden Pictures / Norbert Wu (bc). **Dreamstime.com:** Agami Photo Agency (cla); Photographerlondon (br); Sharon Jones (crb); Vika Ivanets (cb); Freezingpictures / Jan Martin Will (cr); Slowmotiongli (c); Staphy (ca); Biletskiy (t); Viktoria Ivanets (tc). **Getty Images:** Digital Vision / David Tipling (bl). **60 Alamy Stock Photo:** Roger Hutchings (cra); WhiskeyWolf (cl); Ann and Steve Toon (c). **Dreamstime.com:** Adogslifephoto (ca); Chuchart Duangdaw (crb); Biletskiy (b); Comzeal (clb); Hel080808 (cr); Nilanjan Bhattacharya (cla/tiger); Maxirf (cra/anti poaching unit); Sarayut Thaneerat (cla). **61 Dreamstime.com:** Steve Allen (bc); Skylightpictures (cb); Andrey Koturanov (cb/Waterflood); David Pereiras Villagra (br); Romolo Tavani (crb); Win Nondakowit (bl); Gpgroup (clb); Sjors737 (cra); Piotr Wawrzyniuk (cla); Noamfein (tr). **64 Dreamstime.com:** Marc Bruxelle (tr/Maple); Vvoevale (tr); Nadiia Havryliuk Kharzhevska (crb); Zerbor (tr/maple tree)

Cover images: *Front and Back:* **Dreamstime.com:** Irinav; *Front:* **123RF.com:** Aaron Amat bc/ (Ostrich), jackf / Iakov Filimonov cl, madllen (sprout), Liubov Shirokova (Flower), Andrzej Tokarski / ajt fbr, Anatolii Tsekhmister (squirrel); **Dorling Kindersley:** Blackpool Zoo cla, Centre for Wildlife Gardening / London Wildlife Trust (Hollyleaf), Mark Hamblin tc, Liberty's Owl, Raptor and Reptile Centre, Hampshire, UK (tarantula), Natural History Museum, London (butterfly), Jerry Young (Bumblebee); **Dreamstime.com:** Atman (leaf), Marc Bruxelle (MapleLeaf), Carlosphotos (Butterflyx2), Denira777 cr, Lgor Dolgov / Id1974 cra, Dreamstock (Fir), Dvrcan cra/ (weevil), Iakov Filimonov cla/ (goat), Angelo Gilardelli br, Godruma ca/ (beetle), Vasyl Helevachuk (robin), Eric Isselée (Silkworm), Isselee (Deer), Jblackstock / Justin Black tr, Jgade (frog), Johan63 / Johannes Gerhardus Swanepoel (impala), Svetlana Larina / Blair_witch clb, Nejron (parrot), Matee Nuserm fcrb, Pokec / Jan PokornÃ clb/ (Kangaroo), Stu Porter (Cheetah), Alexander Potapov (agaric), Stevenrussellsmithphotos tc/ (Butterfly), Ievgenii Tryfonov cl/ (trunk), Vasiliy Vishnevskiy cb/ (Rook), Vvoevale (brown leaf); **Getty Images:** Fuse cb/ (Jaguar); **Getty Images / iStock:** GlobalP tl, igorkov (eagle); *Back:* **123RF.com:** madllen (sprout), Liubov Shirokova (Flower), Anatolii Tsekhmister (squirrel); **Dorling Kindersley:** Jerry Young (stickleback fish), Centre for Wildlife Gardening / London Wildlife Trust (Hollyleaf), Twan Leenders tl, Liberty's Owl, Raptor and Reptile Centre, Hampshire, UK (tarantula), Natural History Museum, London (butterfly), Jerry Young (Bumblebee); **Dreamstime.com:** Atman (leaf), Marc Bruxelle (MapleLeaf), Dreamstock (Fir), Dvrcan (weevil), Freezingpictures / Jan Martin Will (penguin), Vasyl Helevachuk (robin), Eric Isselée (Silkworm), Isselee (Deer), Jgade (frog), Johan63 / Johannes Gerhardus Swanepoel (impala), Svetlana Larina / Blair_witch ca, Luis Leamus cr, Nejron (parrot), Uros Petrovic crb, Stu Porter (Cheetah), Ievgenii Tryfonov (trunk), Vasiliy Vishnevskiy (Rook), Vvoevale (brown leaf), Zerbor bc; **Getty Images / iStock:** GlobalP (panda), igorkov (eagle); *Spine:* **Dreamstime.com:** Macrovector (snail), Alexander Potapov (agaric)